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REPORT NUMBER 301L-GTL-03-003

**SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 301L
FUEL SYSTEM INTEGRITY**

**FORD MOTOR CO. IN U.S.A.
2003 FORD ESCAPE MPV
NHTSA NO. C30206**

**GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443**



JUNE 04, 2003

FINAL REPORT

PREPARED FOR

**U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-220)
WASHINGTON, D.C. 20590**

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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2003 Ford Escape MPV was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 301 testing to determine if the vehicle was in compliance with the requirements of the standard. The purpose of this standard is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes, and resulting from ingestion of fuels during siphoning.

1.1 The test vehicle was a 2003 Ford Escape MPV. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1FMYU02163KB54830

B. NHTSA No.: C30206

C. Manufacturer: FORD MOTOR CO. IN U.S.A.

D. Manufacture Date: 11/02

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 301 testing on May 19, 2003.

SECTION 2

COMPLIANCE TEST RESULTS SUMMARY

2.0 TEST RESULTS

All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-301-02 dated 8 November 1994 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-301-02, "Fuel System Integrity".

Based on the test performed, the 2003 Ford Escape MPV appears to meet the lateral impact requirements of FMVSS 301 testing.

SECTION 3

COMPLIANCE TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of testing on the 2003 Ford Escape MPV.

SUMMARY OF RESULTS

Vehicle's NHTSA No.: C30206 Test Model: ESCAPETest Date.: 05/19/03 Time: 15:00 Temperature 70 ° F

Vehicle Model Year, Make, Model and Body Style:

2003 FORD ESCAPE MPVVehicle Test Weight: 3656 lbs.; Impact Velocity: 19.6 mph

Type of Front Occupant Restraint System Installed in Test Vehicle:

Driver's DSP: TYPE 2 BELT WITH FRONTAL AIR BAG IN STEERING WHEELRight Passenger's DSP: TYPE 2 BELT WITH FRONTAL AIR BAG IN DASHStoddard solvent spillage from Vehicle's Fuel System: None

REMARKS:

RECORDED BY: [Signature]APPROVED BY: [Signature]DATE: 05/20/03

DATA SHEET 1 **TEST VEHICLE SPECIFICATIONS**

TEST VEHICLE INFORMATION:

NHTSA No.: C30206
 Year/Make/Model/Body Style: 2003 FORD ESCAPE MPV
 Engine Data: 3.0 LITERS V6
 Transmission Data: 4 SPEED AUTOMATIC
 Final Drive Data: 2 WHEEL DRIVE
 Major Options: NONE
 Date Received: 04/09/03; Odometer Reading: 74.1 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: FORD MOTOR CO. IN U.S.A.
 Date of Manufacture: 11/02
 VIN: 1FMYU02163KB54830

GVWR: 1986 kg (4380 lbs.); GAWR Front: 1060 kg (2339 lbs.) GAWR Rear: 1008 kg (2224 lbs.)

DATA FROM VEHICLE'S TIRE PLACARD:

Location of Placard on Vehicle: DRIVER'S "B" PILLAR
 Tire Pressure With Maximum Capacity Vehicle Load —
 Front: 30 psi; Rear: 30 psi
 Recommended Tire Size: P225/70R15
 Recommended Load Range: 1752 lbs. (795 kg)
 Recommended Cold Tire Pressure: Front = 207 kPa (30 psi) Rear = 207 kPa (30 psi)
 Size of Tires on Test Vehicle: P225/70R15
 Type of Spare Tire: SPACE SAVER

Vehicle Capacity Data —

Type of Front Seat(s): BUCKET
 Number of Occupants: Front = 2; Mid = Rear = 3; Total = 5

A. VEHICLE CAPACITY WEIGHT (VCW) =	<u>899</u> lbs.
B. Number of Occupants x 150 lbs. =	<u>750</u> lbs.
RATED CARGO AND LUGGAGE WEIGHT (RCLW) = A - B =	<u>149</u> lbs.

RECORDED BY: [Signature]
 APPROVED BY: [Signature]

DATE: 05/18/03

DATA SHEET 2 PRE-TEST DATA

WEIGHT OF TEST VEHICLE:

A. As Received At Laboratory (Maximum Fluids) —

Right Front = 447.24 kg (986 lbs.) Right Rear = 271.70 kg (599 lbs.)

Left Front = 439.07 kg (968 lbs.) Left Rear = 290.75 kg (641 lbs.)

TOTAL FRONT = 886.31 kg (1954 lbs.) TOTAL REAR = 562.45 kg (1240 lbs.)

% of TOTAL = 61 % % of TOTAL = 39 %

TOTAL DELIVERED WEIGHT = 1448.77 kg (3194 lbs.)

B. Calculation of Target Test Weight —

1. Total Delivered Weight = 1448.77 kg (3194 lbs.)

2. Rated Cargo & Lugg. Weight (RCLW) = 67.58 kg (149 lbs.)

3. Weight of 2 Dummies (164 lbs. each) = 148.77 kg (328 lbs.)

TARGET TEST WEIGHT = 1 + 2 + 3 = 1665.13 kg (3671 lbs.)

C. Vehicle, Dummies and 79.37 kg (175 lbs.) of Cargo Weight —

Right Front = 473.55 kg (1044 lbs) Right Rear = 327.49 kg (722 lbs)

Left Front = 470.82 kg (1038 lbs) Left Rear = 364.23 kg (803 lbs)

TOTAL FRONT = 944.37 kg (2082 lbs) TOTAL REAR = 691.72 kg (1525 lbs)

% of TOTAL = 58 % % of TOTAL = 42 %

TOTAL TEST WEIGHT = 1658.78 kg (3657 lbs)

Weight of Ballast secured in cargo area = 79.37 kg (175 lbs)

Type of Ballast: SAND BAGS

Method of Securing Ballast: VEHICLE TIE DOWN HOOKS

Vehicle Components Removed for Weight Reduction:

NONE

DATA SHEET 2

PRE-TEST DATA CONTINUED

TEST VEHICLE ATTITUDE:

As Delivered — Right Front: 815 mm (32.08 inches)
 Left Front: 810 mm (31.88 inches)
 Right Rear: 850 mm (33.46 inches)
 Left Rear: 845 mm (33.26 inches)

As Tested — Right Front: 804 mm (31.65 inches)
 Left Front: 800 mm (31.49 inches)
 Right Rear: 820 mm (32.28 inches)
 Left Rear: 815 mm (32.08 inches)

Vehicle's Wheelbase = 2620 mm (103.1 inches)

FUEL SYSTEM DATA:

Fuel System Capacity Listed in Owner's Manual = 61 liters (16 gallons)
 Usable Capacity Figure Furnished By COTR = 61 liters (16 gallons)

Test Volume Range (91 to 94% of Usable Capacity) — 92.5%

55.64 liters (14.7 gallons) TO 57.15 liters (15.1 gallons)

ACTUAL TEST VOLUME = 56.40 liters (14.9 gallons) (with entire fuel system filled)

Test Fluid Type: Stoddard solvent

Test Fluid Specific Gravity: 7583

Test Fluid Kinematic Viscosity: 1.7 centistokes at 77° F

Test Fluid Color: BLUE ("red" is preferred)

Type of Vehicle Fuel Pump: HIGH PRESSURE ELECTRIC

Electric Fuel Pump Operation with Ignition Switch ON and Engine OFF —

NO, PUMP ONLY OPERATES WITH ENGINE RUNNING

Details of Fuel System: HIGH PRESSURE ELECTRIC PUMP SUPPLYING FUEL INJECTORS WITH LOW PRESSURE RETURN LINE TO FUEL TANK.

REMARKS:

RECORDED BY: [Signature]

APPROVED BY: [Signature]

DATE: 05/19/03

DATA SHEET 3
POST IMPACT DATA

TYPE OF TEST: 301L
TEST DATE: 05/19/03 ; TIME: 17:00 ; TEMP.: 70 °F
VEH. NHTSA NO.: C30206 ; VIN: 1FMYU02163KB54830

REQUIRED IMPACT VELOCITY RANGE: 18.9 to 19.9 mph

ACTUAL IMPACT VELOCITY: (speed traps located within 5 feet of impact plane)

Trap No. 1 = 19.65 mph Trap No. 2 = 19.60 mph
Average Impact Speed = 19.6 mph

REMARKS:

RECORDED BY: [Signature]
APPROVED BY: [Signature]

DATE: 05/20/02

DATA SHEET 4
SUMMARY OF FMVSS 301 DATA

TEST VEHICLE NHTSA NO.: C30206 ; TEST DATE: 05/19/03

VEHICLE YEAR/MAKE/MODEL/BODY STYLE:

2003 FORD ESCAPE MPV

TYPE OF IMPACT: 301L

STODDARD SOLVENT SPILLAGE MEASUREMENT:

A. From impact until vehicle motion ceases —

Actual = 0 oz. Maximum Allowable = 1 ounce

B. For 5 minute period after vehicle motion ceases —

Actual = 0 oz. Maximum Allowable = 5 ounces

C. For next 25 minutes —

Actual = 0 oz. Maximum Allowable = 1 oz./minute

D. Provide Spillage Details: NONE

REMARKS:

RECORDED BY: [Signature]
APPROVED BY: [Signature]

DATE: 05/19/03

DATA SHEET 5 **STATIC ROLLOVER TEST DATA:**

A. Test Phase = 0° to 90°

Determination of Stoddard Solvent
Collection Time Period:

1. Rollover Fixture 90° Rotation Time = 1
minutes, 36 seconds

(Specified Range is 1 to 3
minutes)

2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 36 seconds

4. NEXT WHOLE MINUTE INTERVAL =
7 minutes

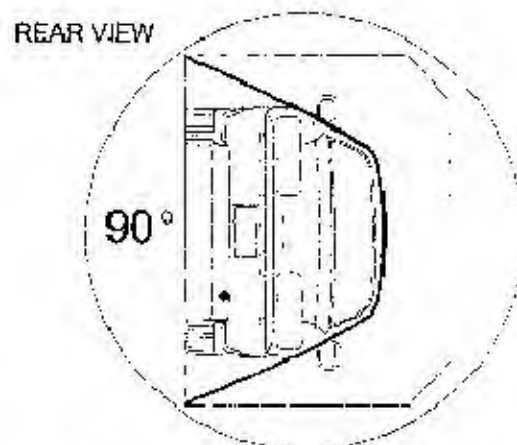
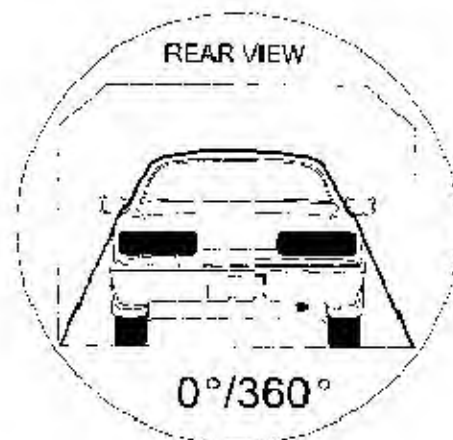
Actual Test Vehicle Stoddard Solvent
Spillage:

1. First 5 minutes from onset of
rotation = 0 oz.
(5 oz. allowed)

2. 6th minute = 0 oz.
(1 oz. allowed)

3. 7th minute = 0 oz.
(1 oz. allowed)

4. 8th minute (if required) = N/A oz. (1 oz. allowed)



Provide Details of Stoddard Solvent Spillage Locations — NONE

DATA SHEET 5 CONTINUED

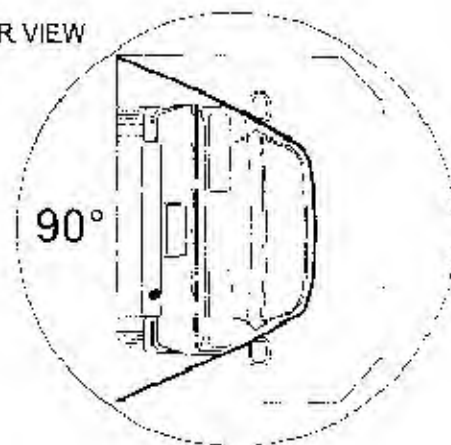
B. Test Phase = 90° to 180°

Determination of Stoddard
Solvent Collection Time Period:

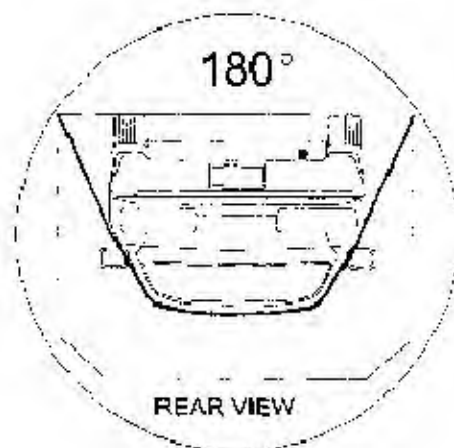
1. Rollover Fixture 90°

Rotation Time = 1 minutes,
34 seconds(Specified Range is 1 to 3
minutes)2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds3. TOTAL = 6 minutes, 34 seconds4. NEXT WHOLE MINUTE INTERVAL =
7 minutesActual Test Vehicle Stoddard
Solvent Spillage:1. First 5 minutes from onset of
rotation = 0 oz.
(5 oz. allowed)2. 6th minute = 0 oz.
(1 oz. allowed)3. 7th minute = 0 oz.
(1 oz. allowed)4. 8th minute (if required) = N/A oz. (1 oz. allowed)Provide Details of Stoddard Solvent Spillage Locations — NONE

REAR VIEW

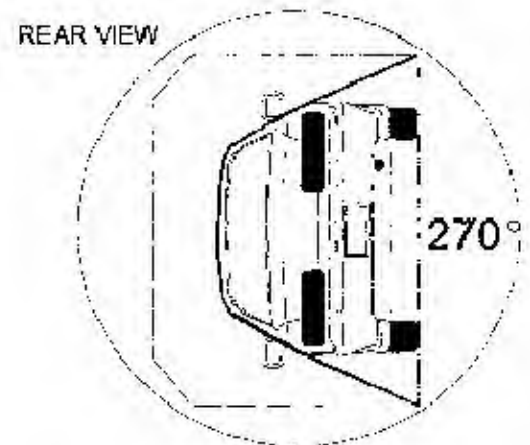
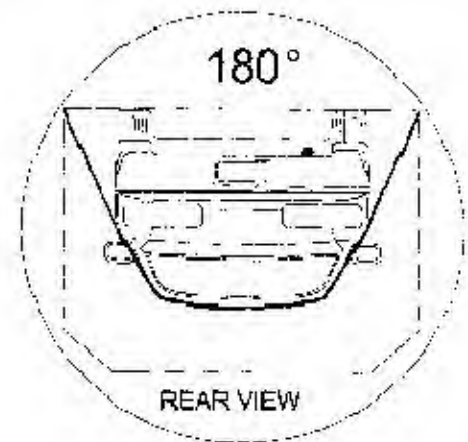


180°



DATA SHEET 5 CONTINUED

C. Test Phase = 180° to 270°

Determination of Stoddard
Solvent Collection Time Period:1. Rollover Fixture 90°
Rotation Time = 1 minutes,
29 seconds(Specified Range is 1 to 3
minutes)2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds3. TOTAL = 6 minutes, 29 seconds4. NEXT WHOLE MINUTE
INTERVAL = 7 minutesActual Test Vehicle Stoddard
Solvent Spillage:1. First 5 minutes from onset of
rotation = 0 oz.
(5 oz. allowed)2. 6th minute = 0 oz.
(1 oz. allowed)3. 7th minute = 0 oz.
(1 oz. allowed)4. 8th minute (if required) = N/A oz. (1 oz. allowed)Provide Details of Stoddard Solvent Spillage Locations — NONE

DATA SHEET 5 CONTINUED

D. Test Phase = 270° to 360°

Determination of Stoddard
Solvent Collection Time Period:

1. Rollover Fixture 90°
Rotation Time = 1 minutes,
40 seconds

(Specified Range is 1 to 3
minutes)

2. FMVSS 301 Position Hold
Time = 5 minutes, 0 seconds

3. TOTAL = 6 minutes, 40 seconds

4. NEXT WHOLE MINUTE INTERVAL =
7 minutes

Actual Test Vehicle Stoddard
Solvent Spillage:

1. First 5 minutes from onset of
rotation = 0 oz.
(5 oz. allowed)

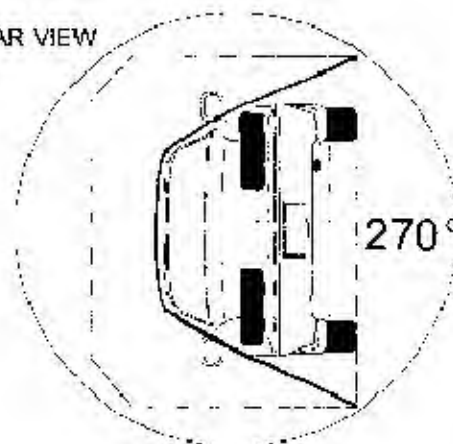
2. 6th minute = 0 oz.
(1 oz. allowed)

3. 7th minute = 0 oz.
(1 oz. allowed)

4. 8th minute (if required) = N/A oz. (1 oz. allowed)

Provide Details of Stoddard Solvent Spillage Locations — NONE

REAR VIEW



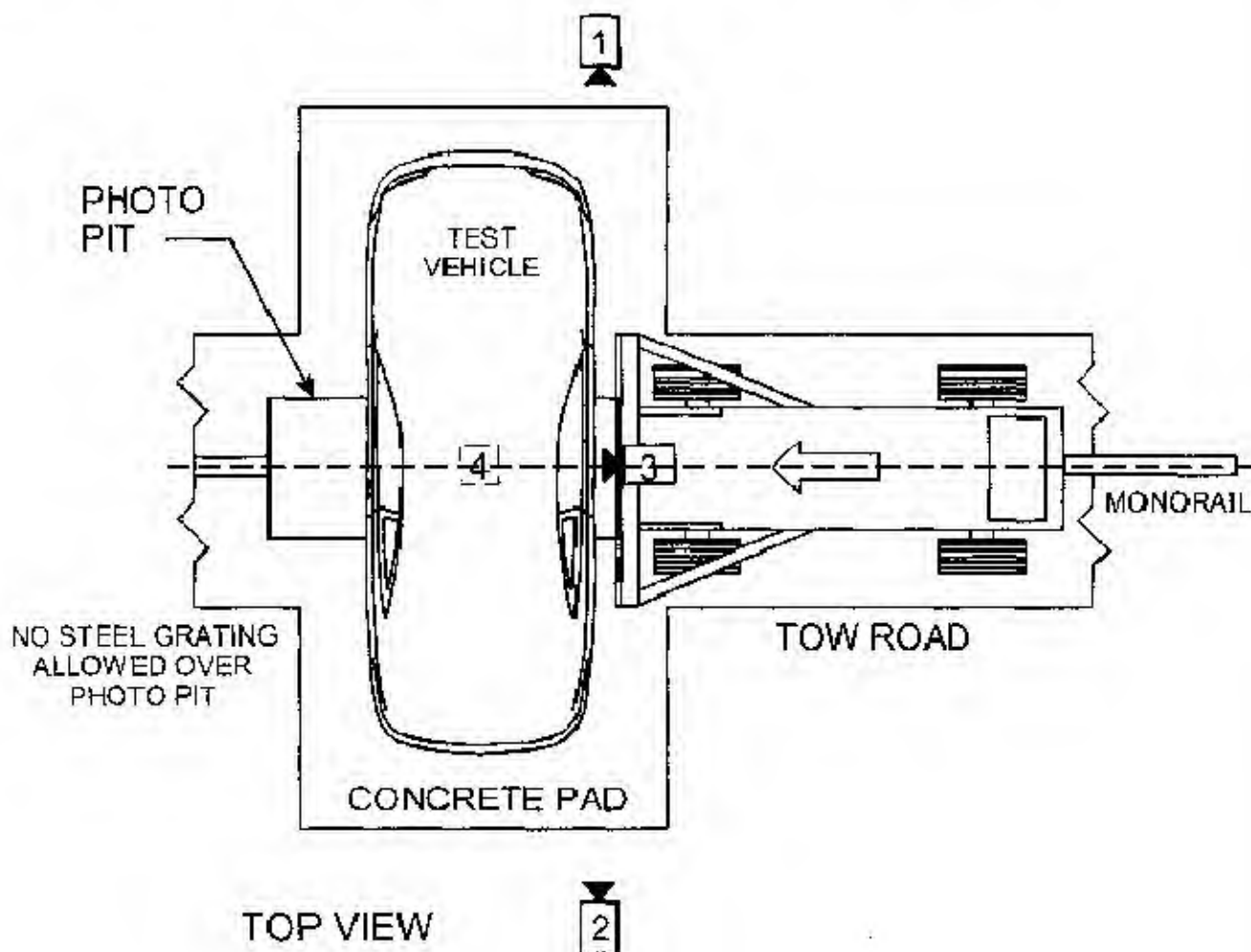
REAR VIEW



DATA SHEET 6 **CAMERA LOCATION**

VEHICLE NHTSA NO.: C30206

TEST DATE: 05/19/03



- CAMERA 1 – REAR SIDE VIEW OF VEHICLE DURING CRASH
- CAMERA 2 – FRONT SIDE VIEW OF VEHICLE DURING CRASH
- CAMERA 3 – OVERHEAD VIEW OF ENTIRE IMPACT
- CAMERA 4 – UNDERBODY VIEW OF FUEL TANK LOCATED IN PIT

SECTION 4
INSTRUMENTATION AND EQUIPMENT LIST

TABLE 1 - INSTRUMENTATION & EQUIPMENT LIST

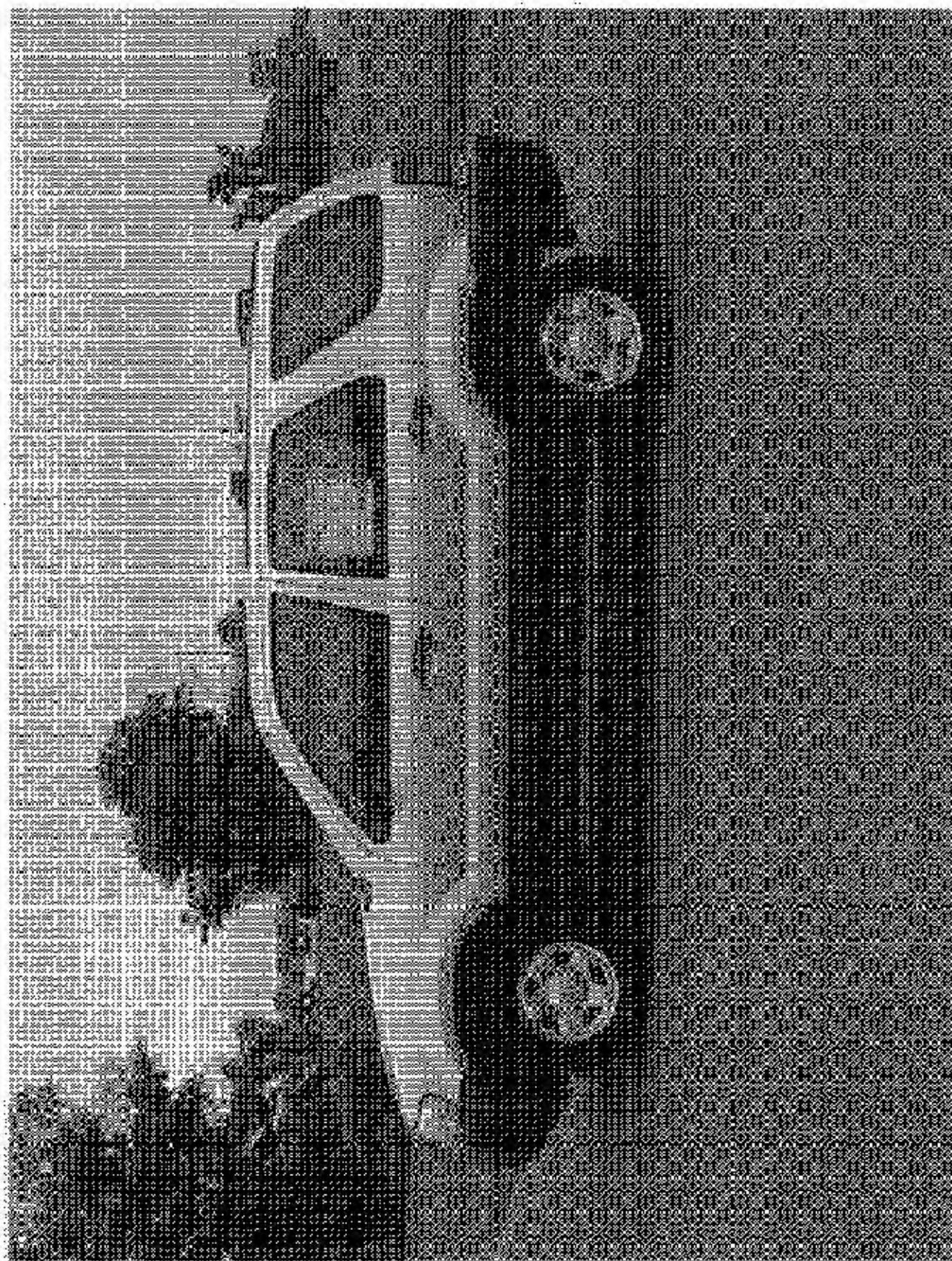
EQUIPMENT	DESCRIPTION	MODEL/ SERIAL NO.	CAL. DATE	NEXT CAL. DATE
COUNTER/TIMER	SYSTRON DONNER	19 353-10	04/03	04/04
COUNTER/TIMER	SYSTRON DONNER	19 353- 11	03/03	03/04
SPEED TRAP 2	GTL ST1	N/A	08/02	08/03
SPEED TRAP 3	GTL ST2	N/A	08/02	08/03
STOP WATCH	ACCUSPLIT	ACT 1 A&B	05/03	05/04
STOP WATCH	ACCUSPLIT	ACT 2 A&B	05/03	05/04
SCALES	INTERCOMP	199744	05/03	05/04
TIRE PRESSURE GAUGE	WEKSLER	0-100	05/03	05/04
STEEL SCALES	STARRETT	C416R	05/03	05/04
STEEL TAPE	STANLEY	GF2	05/03	05/04
LEVEL	STANLEY	42-449	05/03	05/04
TEMP. INDICATOR	OMEGA	B/5562/14/1	05/03	05/04
TEMP. RECORDER	OMEGA	B/5562/14/1	05/03	05/04
SCALES	FAIRBANKS	N/A	06/02	06/03

SECTION 5
PHOTOGRAPHS



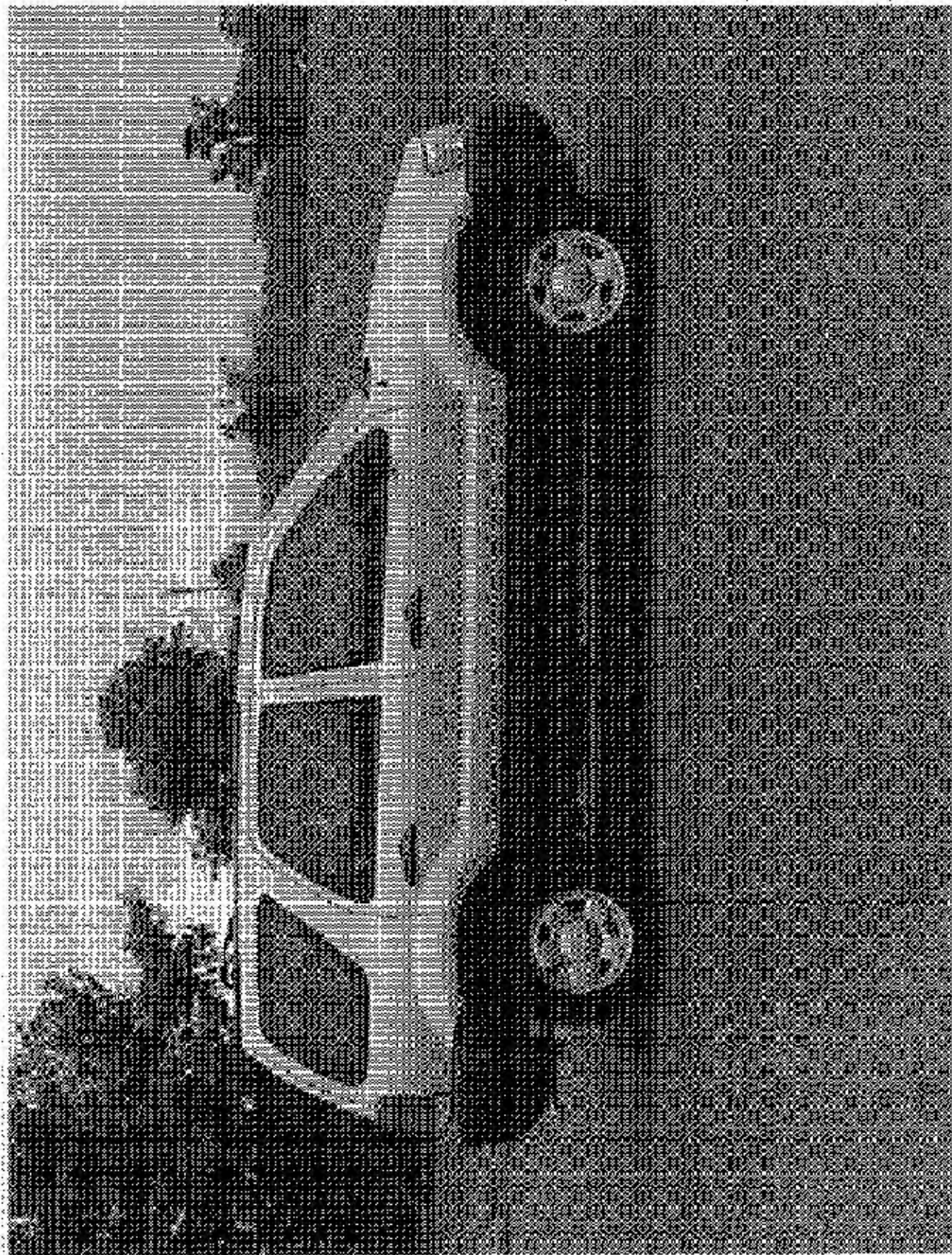
2003 FORD ESCAPE
NHTSA NO. C30286
FMVSS NO. 301L

FIGURE 5.1
FRONT VIEW OF VEHICLE PRE-TEST



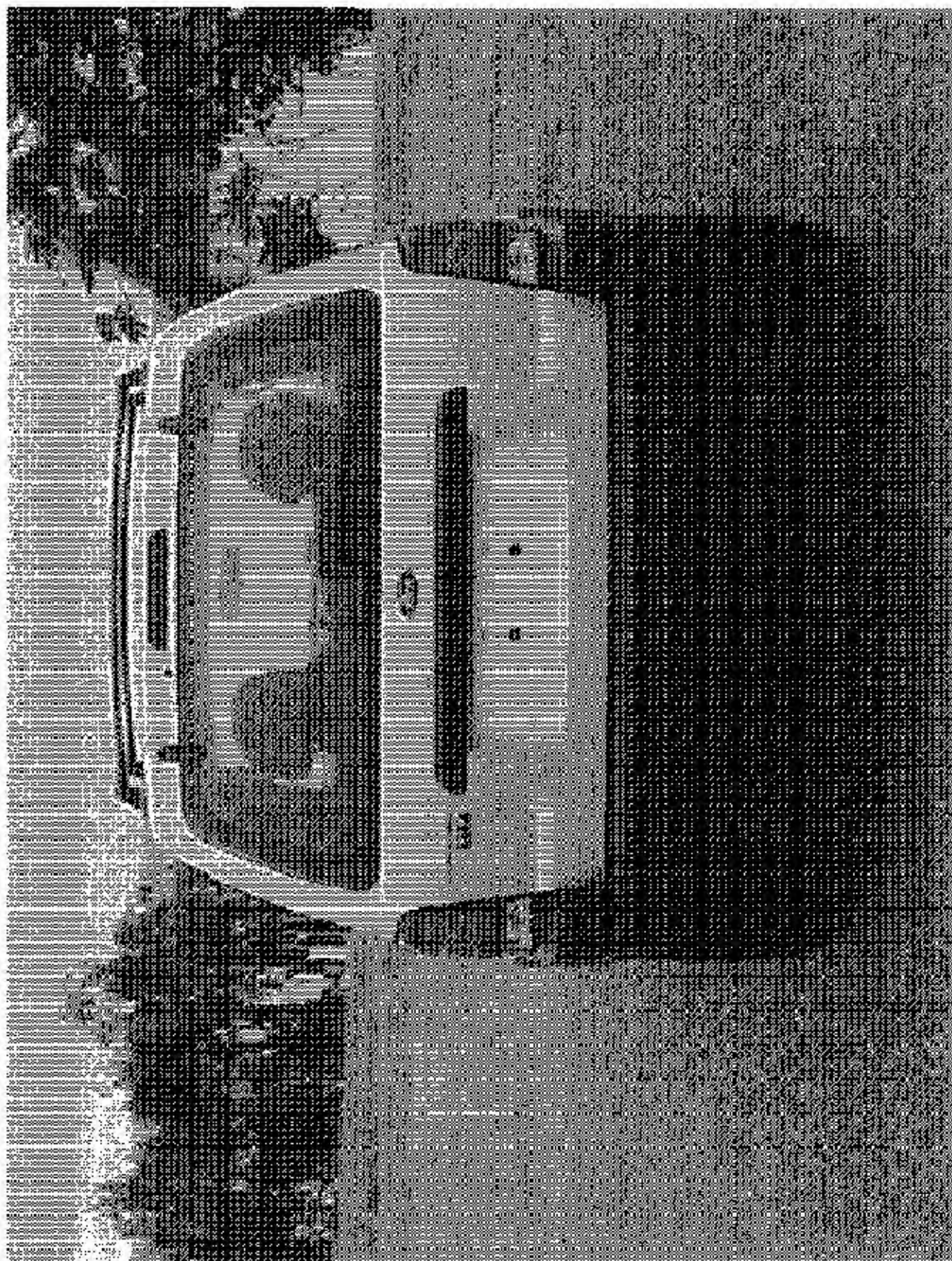
2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.2
LEFT SIDE VIEW OF VEHICLE PRE-TEST



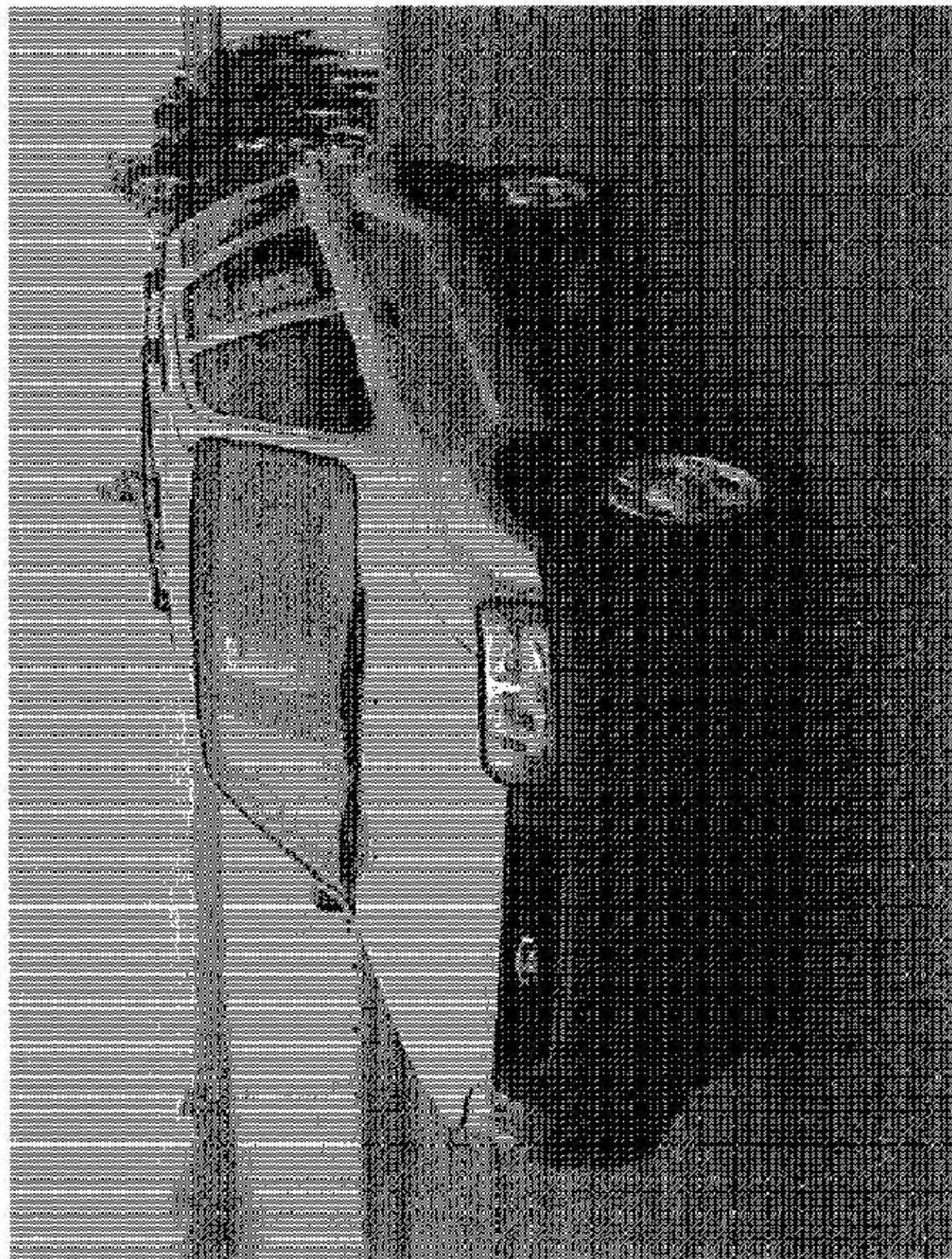
2003 FORD ESCAPE
NHTSA NO. C30106
FMVSS NO. 301L

FIGURE 53
RIGHT SIDE VIEW OF VEHICLE PRE-TEST



2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.4
REAR VIEW OF VEHICLE PRE-TEST



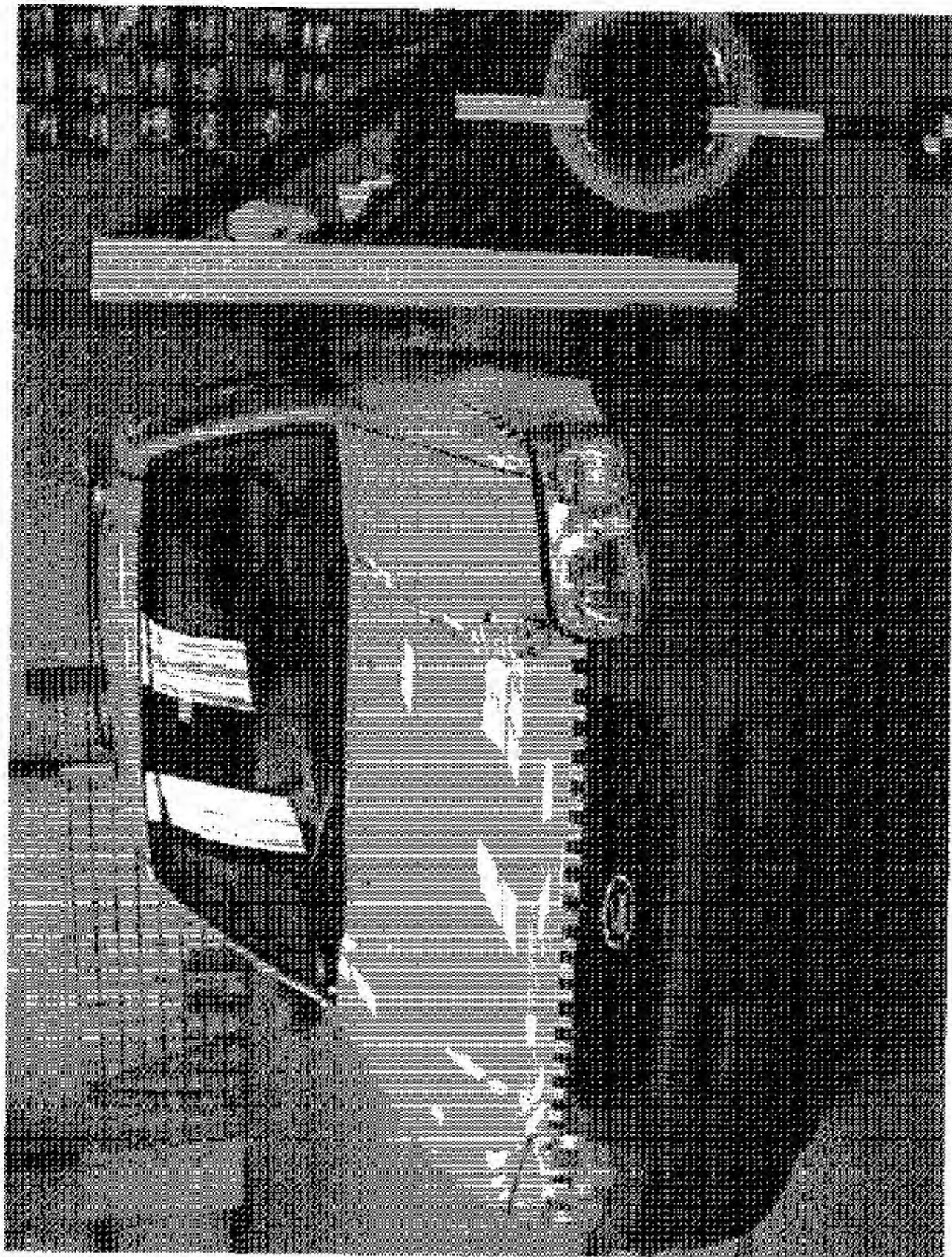
2003 FORD ESCAPE
NHSTA NO. C30206
FMVSS NO. 301L

FIGURE 5.5
3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
PRE-TEST



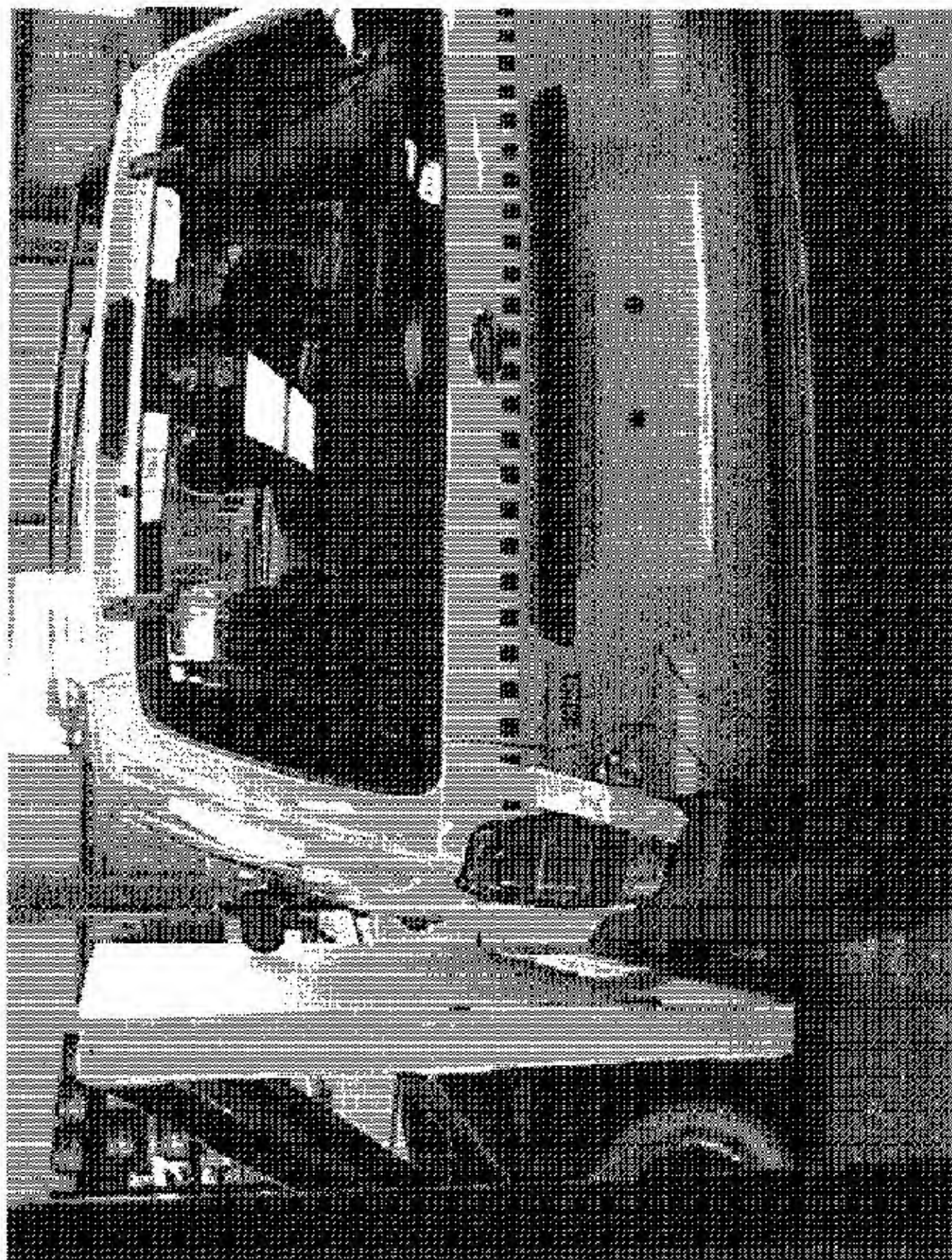
2003 FORD ESCAPE
NIHT SA NO. C30206
FMVSS NO. 301L

FIGURE 5.6
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
PRE-TEST



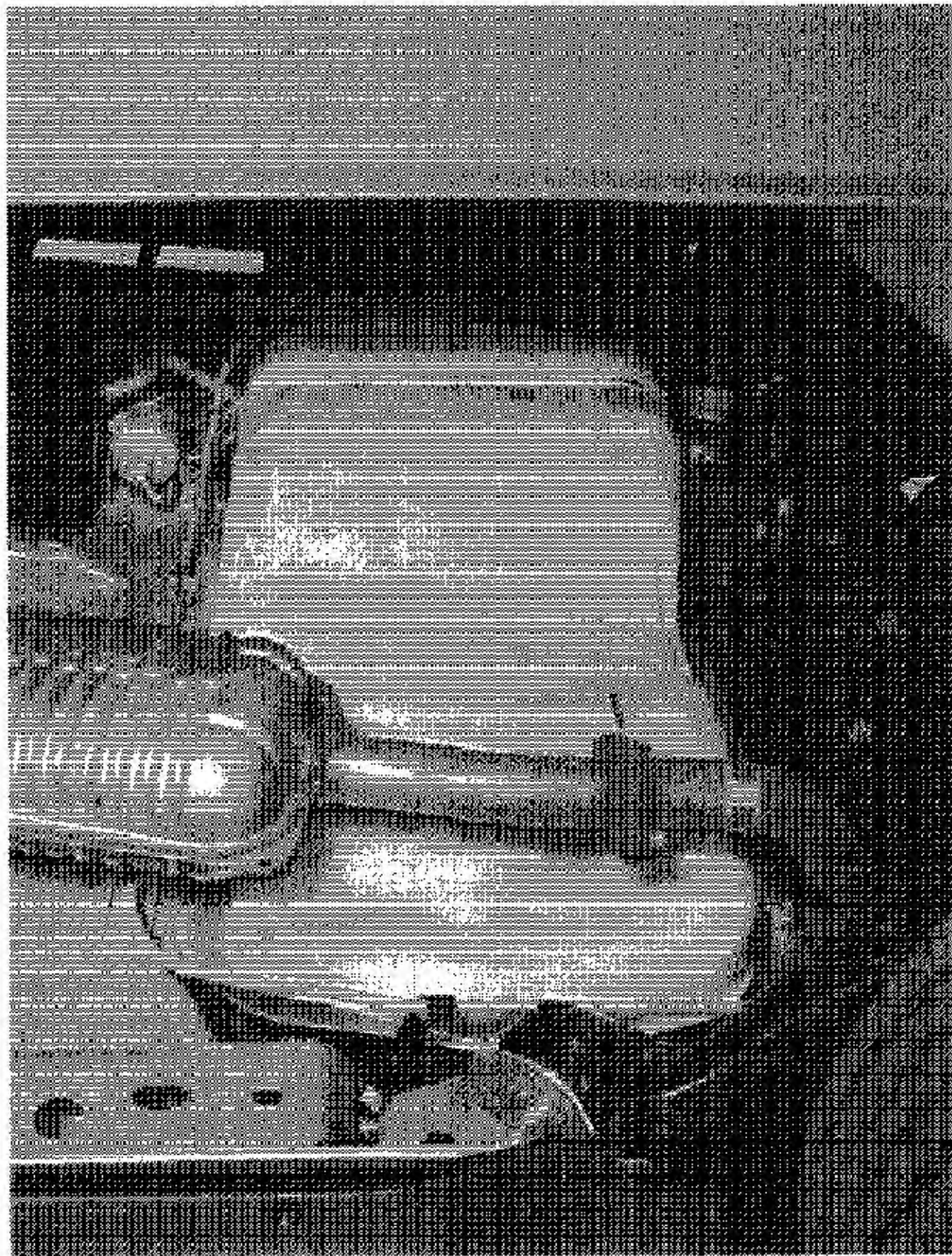
2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.7
LEFT VIEW OF VEHICLE/BARRIER PRE-TEST



2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 3011.

FIGURE 5.8
RIGHT VIEW OF VEHICLE/BARRIER PRE-TEST



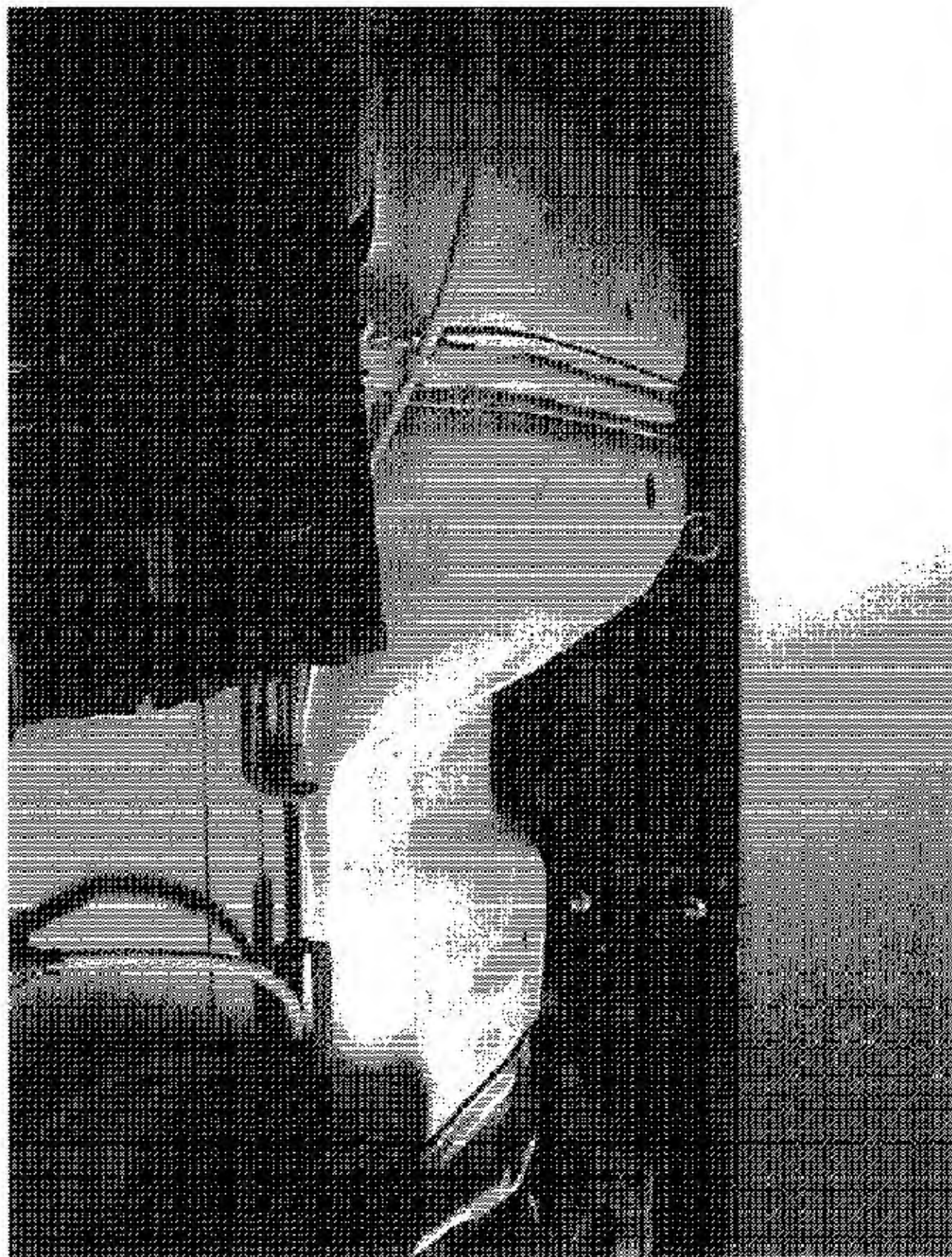
2003 FORD ESCAPE
NHTSA NO. C30296
FMVSS NO. 301L

FIGURE 5.9
UNDERBODY VIEW OF FUEL TANK RIGHT VIEW
PRE-TEST



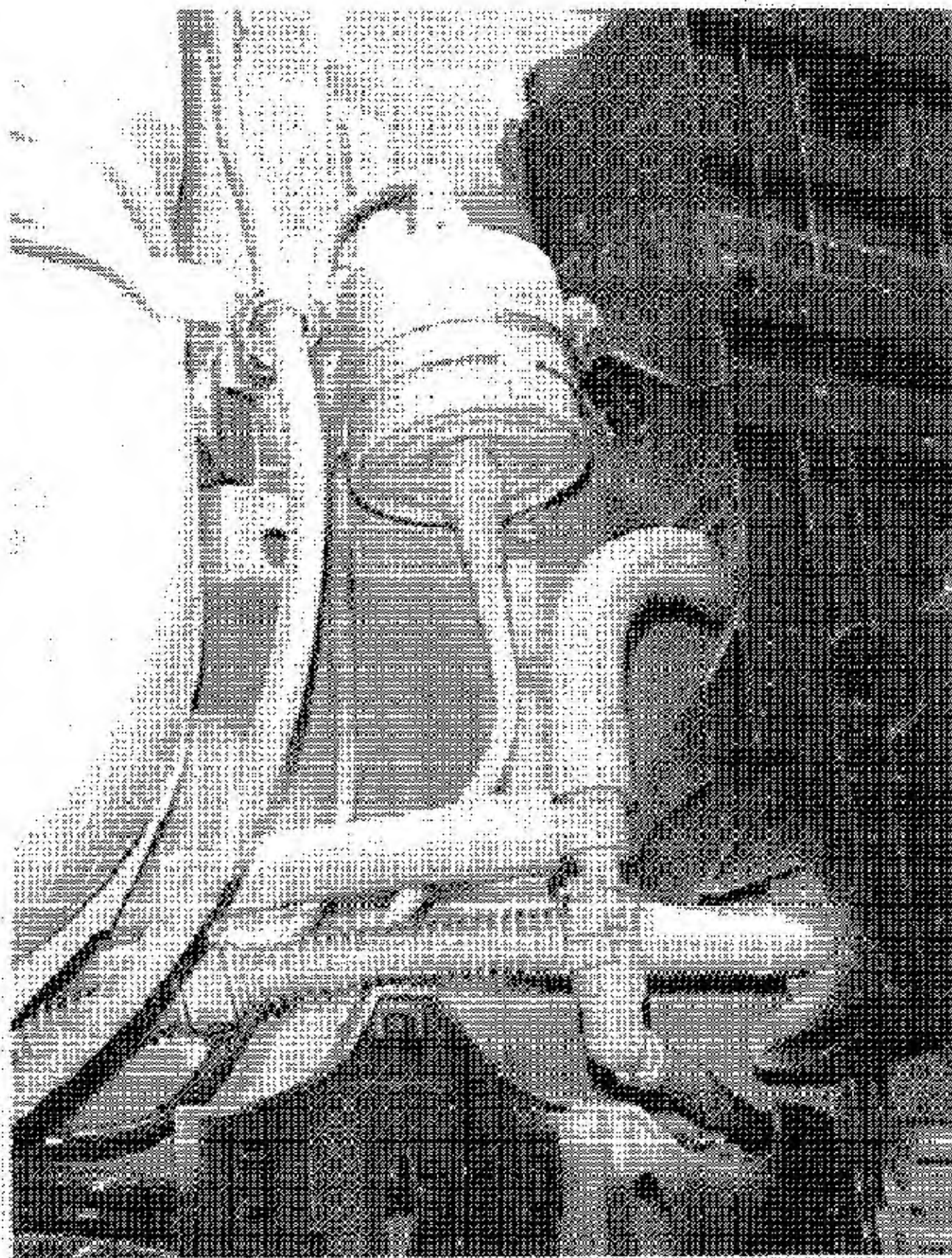
2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.10
UNDERBODY VIEW OF FUEL TANK LEFT VIEW
PRE-TEST



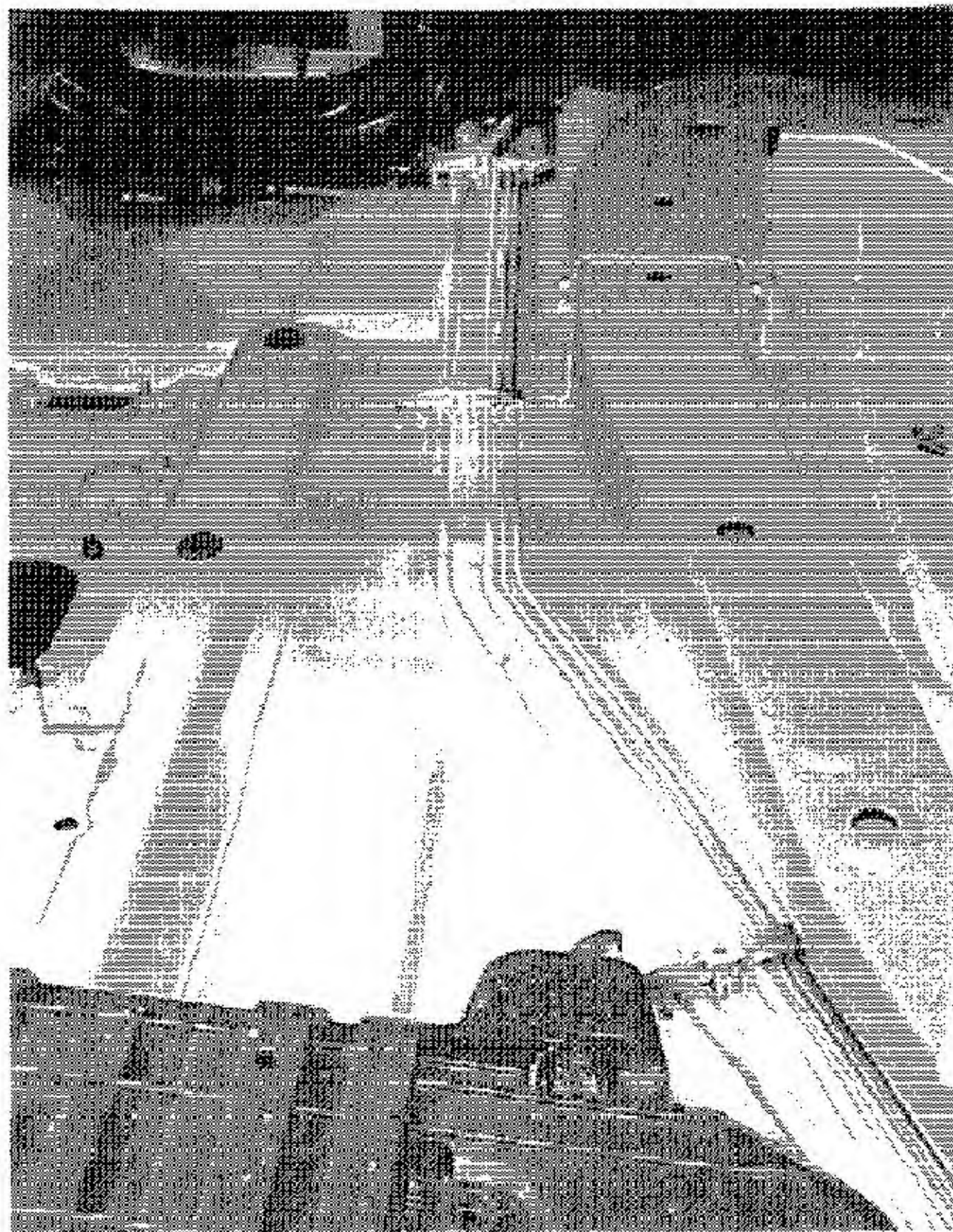
2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 3011.

FIGURE 5.11
UNDERBODY VIEW OF FUEL TANK FRONT VIEW
PRE-TEST



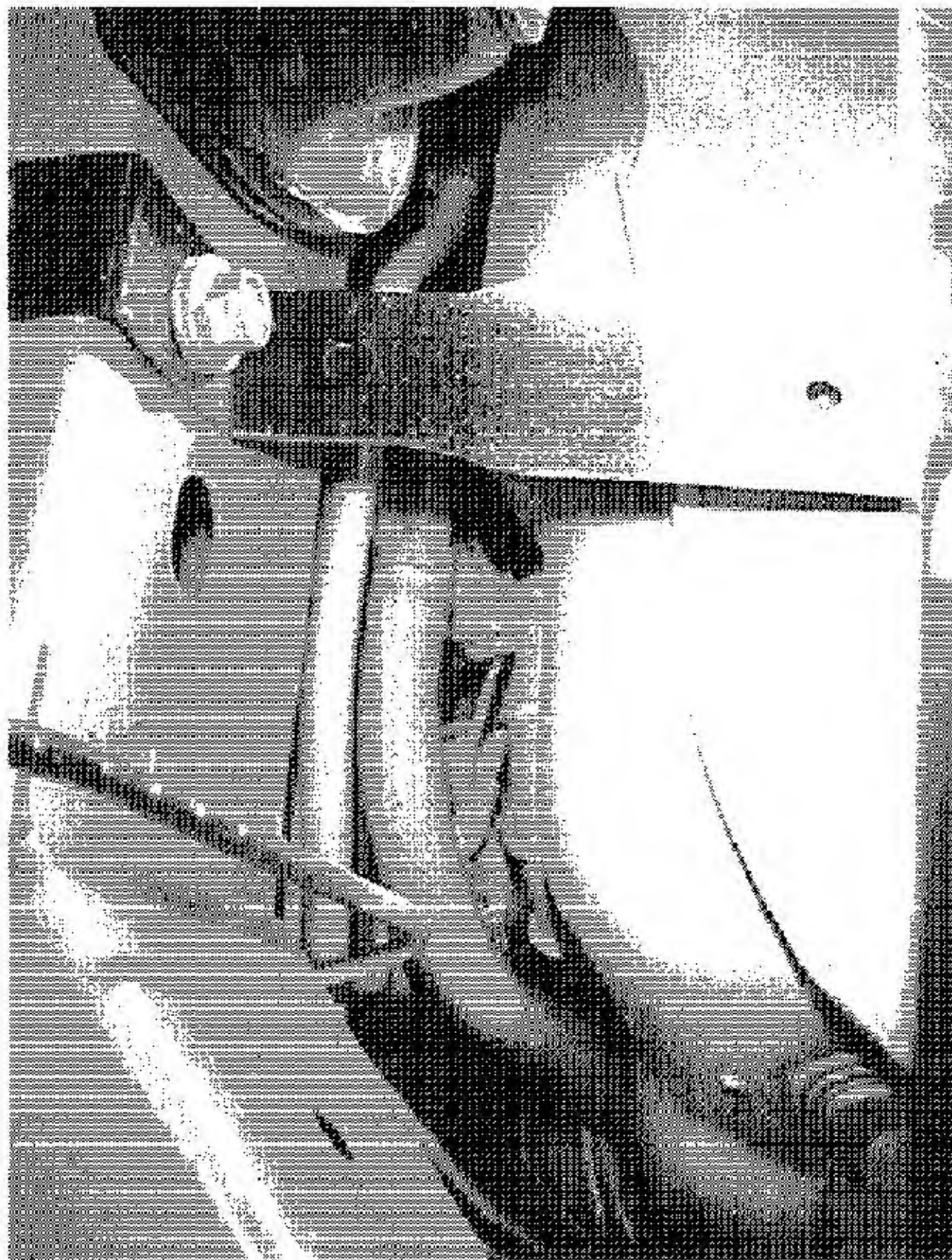
2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.12
UNDERBODY VIEW OF FUEL LINES AND FUEL
FILTER PRE-TEST



2003 FORD ESCAPE
NHTSA NO. C30286
FMVSS NO. 301L

FIGURE 5.13
UNDERBODY VIEW OF FUEL LINES MID VIEW
PRE-TEST



2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301E

FIGURE 5.14
UNDERBODY VIEW OF FUEL LINES AT TANK
PRE-TEST

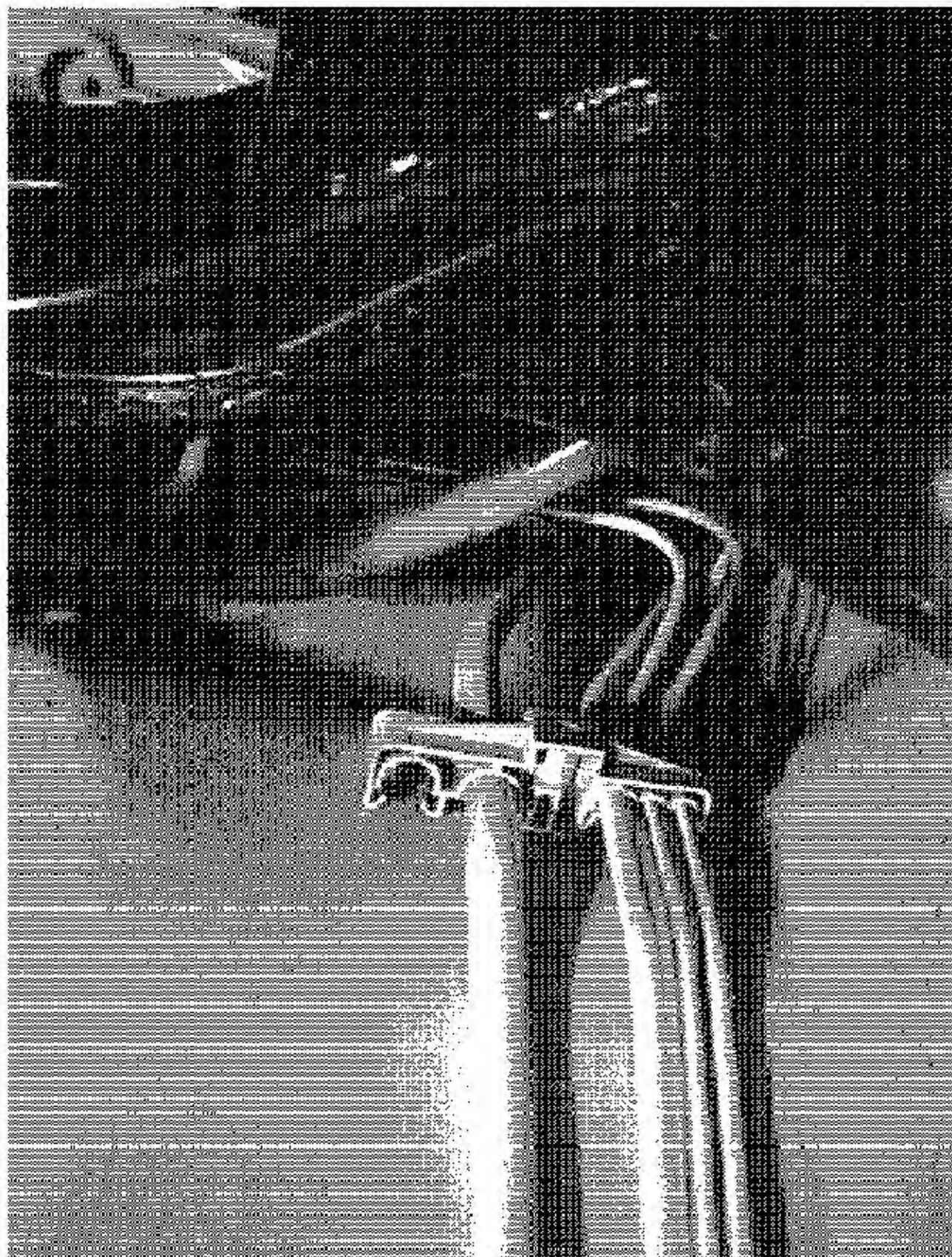
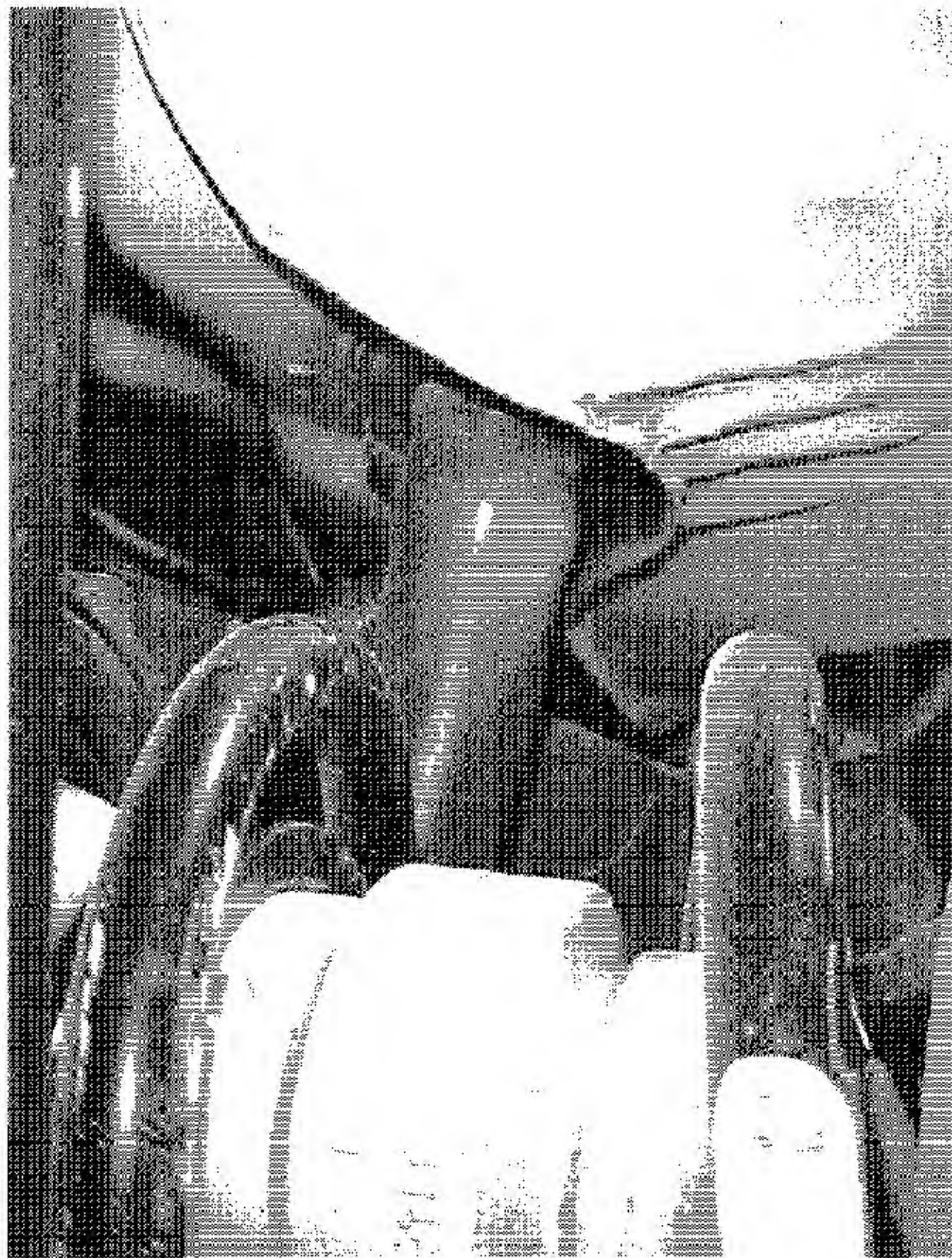


FIGURE 5.15
VIEW OF FUEL LINES AT ENGINE PRE-TIGHT

2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L



2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301E

FIGURE S.16
UNDERBODY VIEW OF FUEL FILL LINES AT
TANK PRE-TEST



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FIGURE 5.17
UNDERBODY VIEW OF FUEL FILL LINES AT TOP
PRE-TEST

RECOMMENDED TIRE SIZE AND INFLATION PRESSURE (COLD)

(EX-100014)

TIRE SIZE	TIRE PRESSURE FRONT	TIRE PRESSURE REAR
P225/70R16 P225/70R16S P225/70R16S	210 LBS / 30 PSI	210 LBS / 35 PSI

800 LBS
600 LBS

VEHICLE CAPACITY

SEATING CAPACITY	FRONT SEAT	BACK SEAT	TOTAL
	2	3	5

TO AVOID SERIOUS INJURY OR DEATH FROM LOSS OF VEHICLE CONTROL, REPLACE TIRES WITH THE SAME SIZE, TYPE, AND SPEED RATED TIRES AS SHOWN ON THE CERTIFICATION LABEL.

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FIGURE 5.19
VEHICLE TIRE INFORMATION LABEL

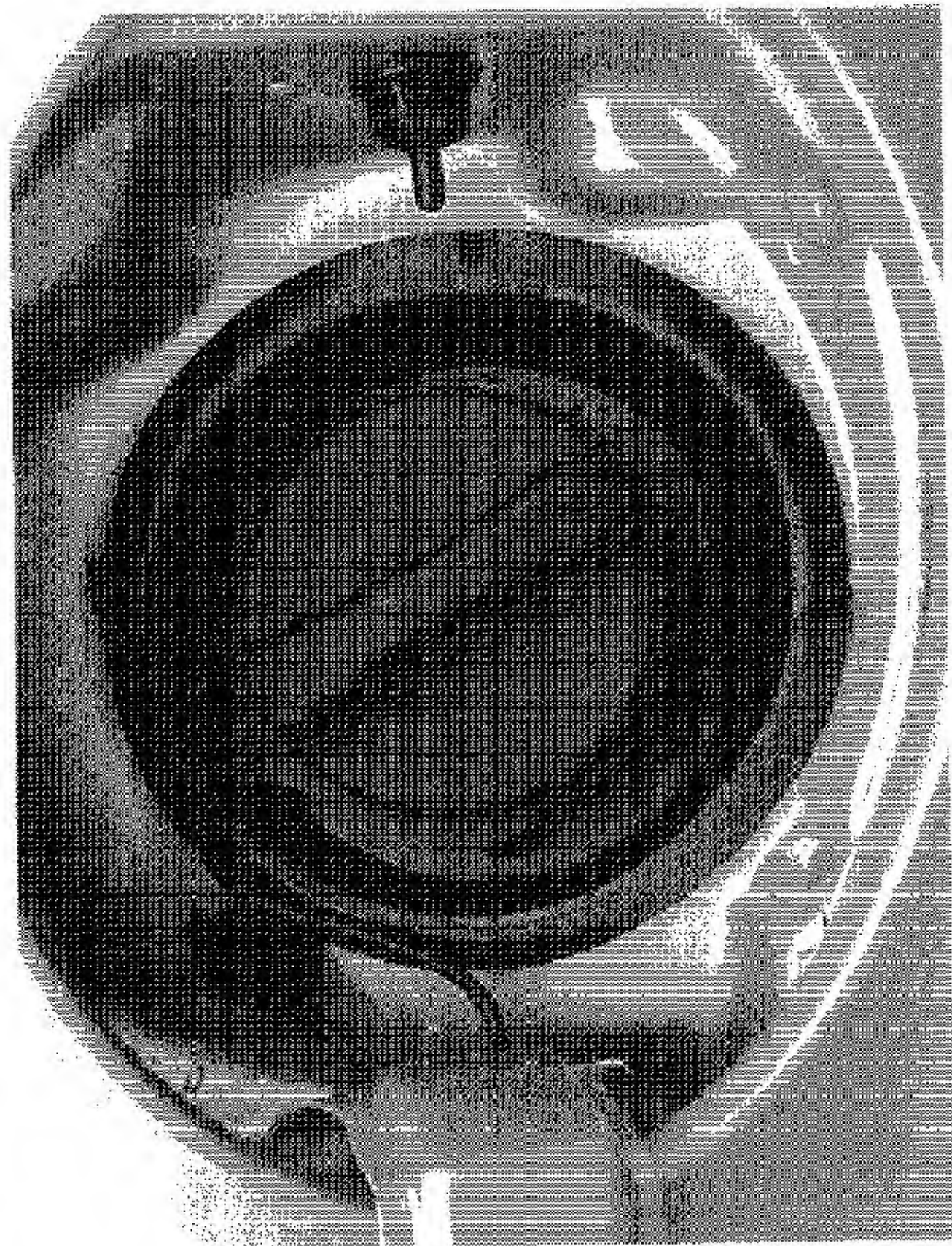


FIGURE 5.20
VEHICLE FUEL CAP PRE-TEST

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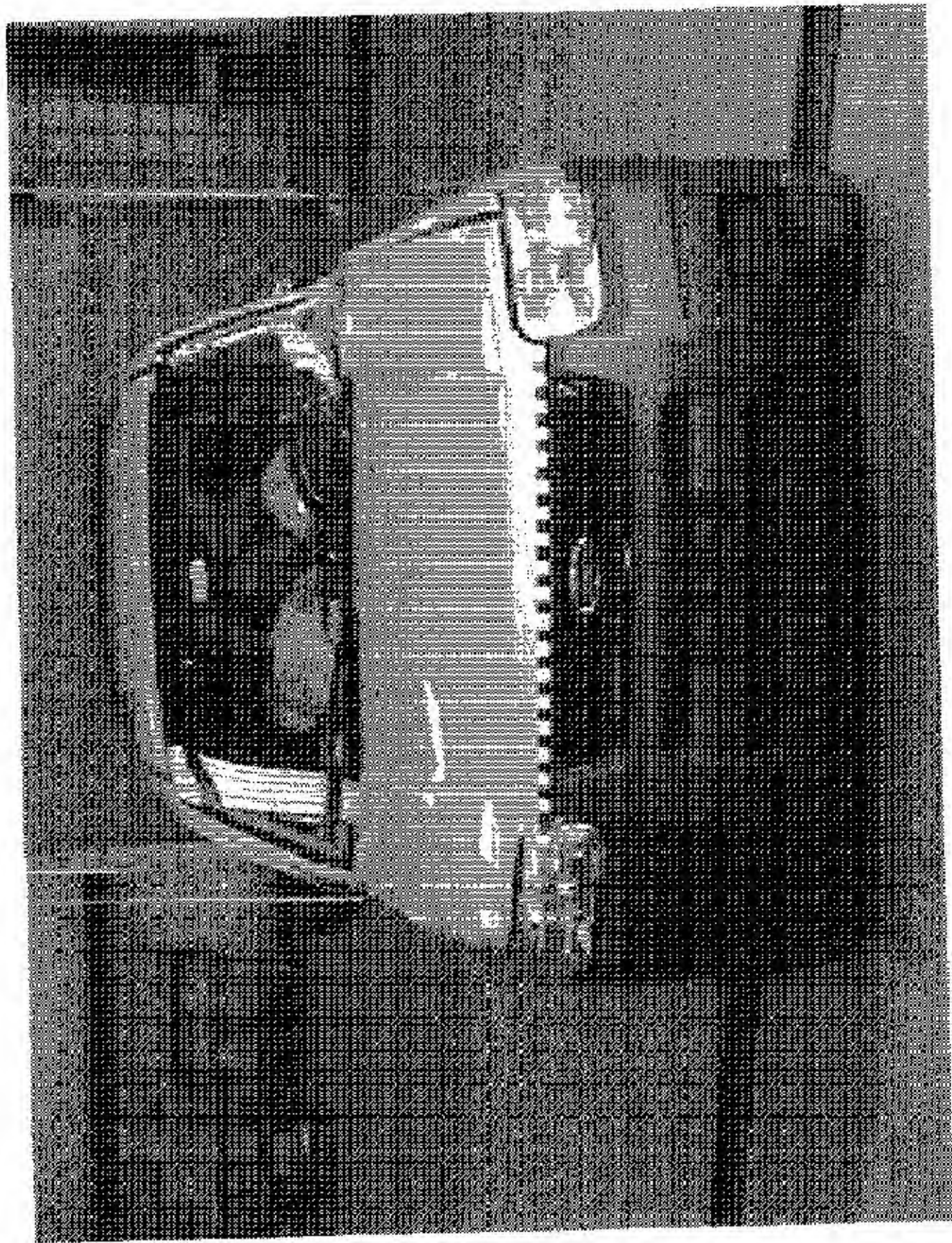
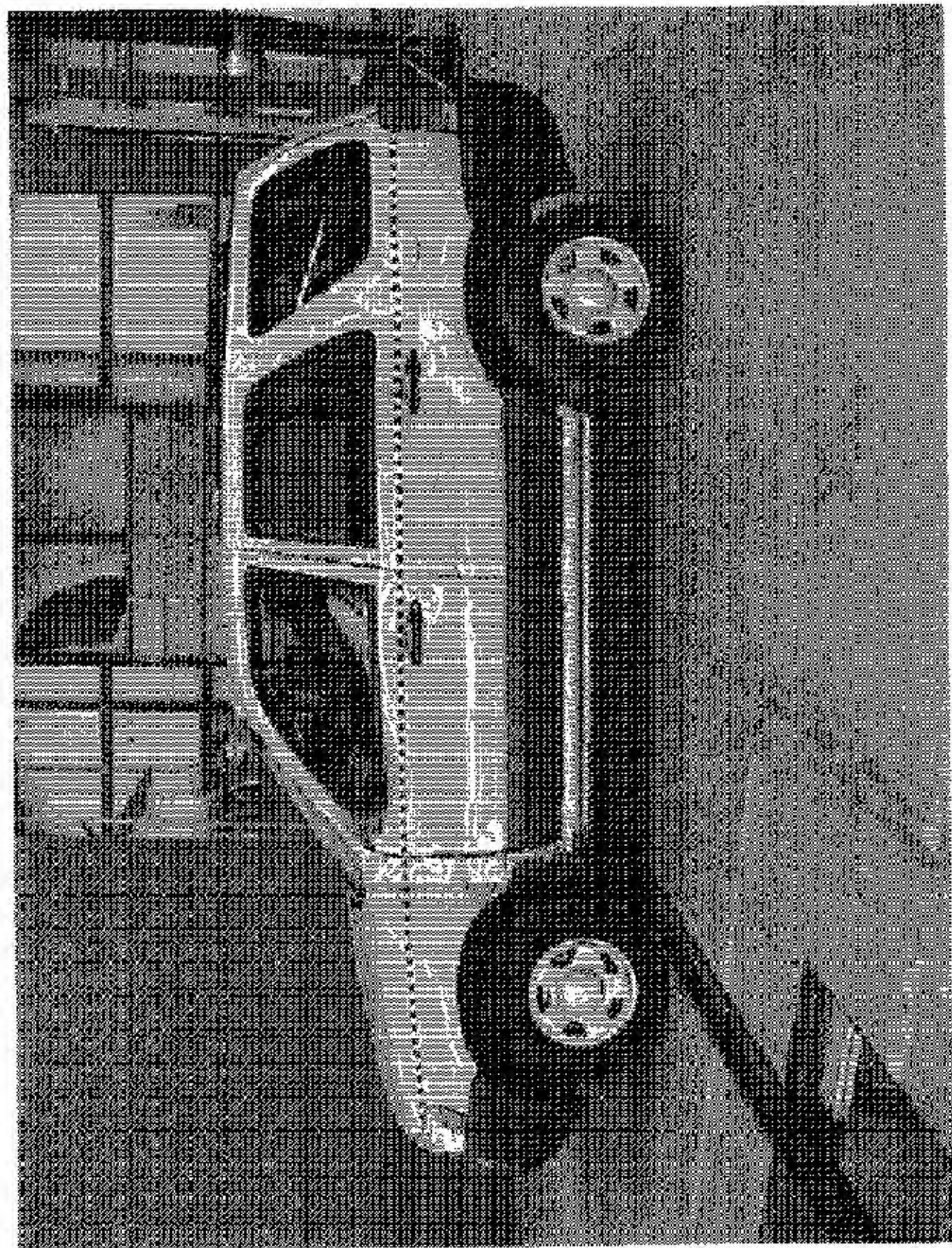


FIGURE 5.21
FRONT VIEW OF VEHICLE POST TEST

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FIGURE 5.22
LEFT SIDE VIEW OF VEHICLE POST TEST

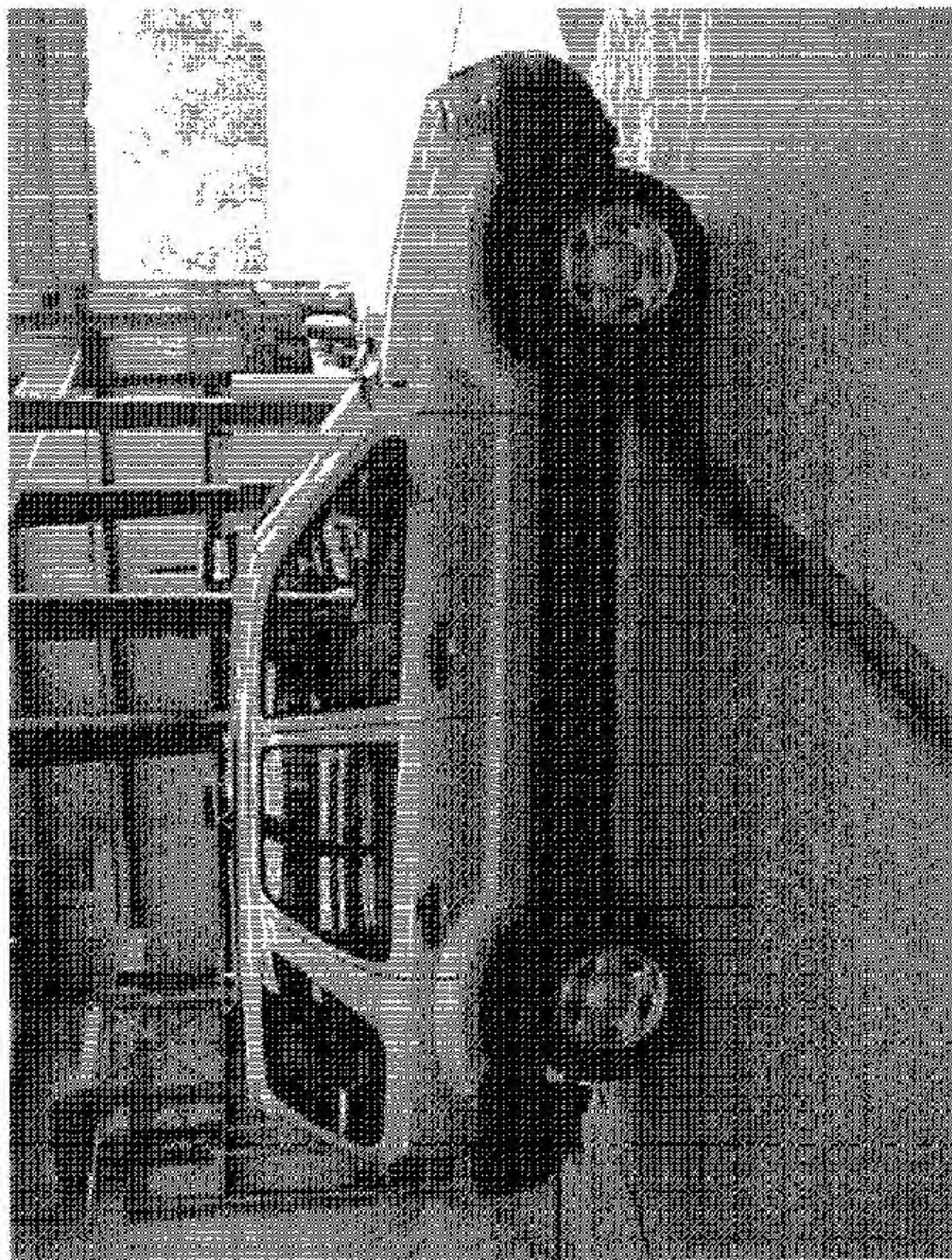


FIGURE 5.23
RIGHT SIDE VIEW OF VEHICLE POST TEST

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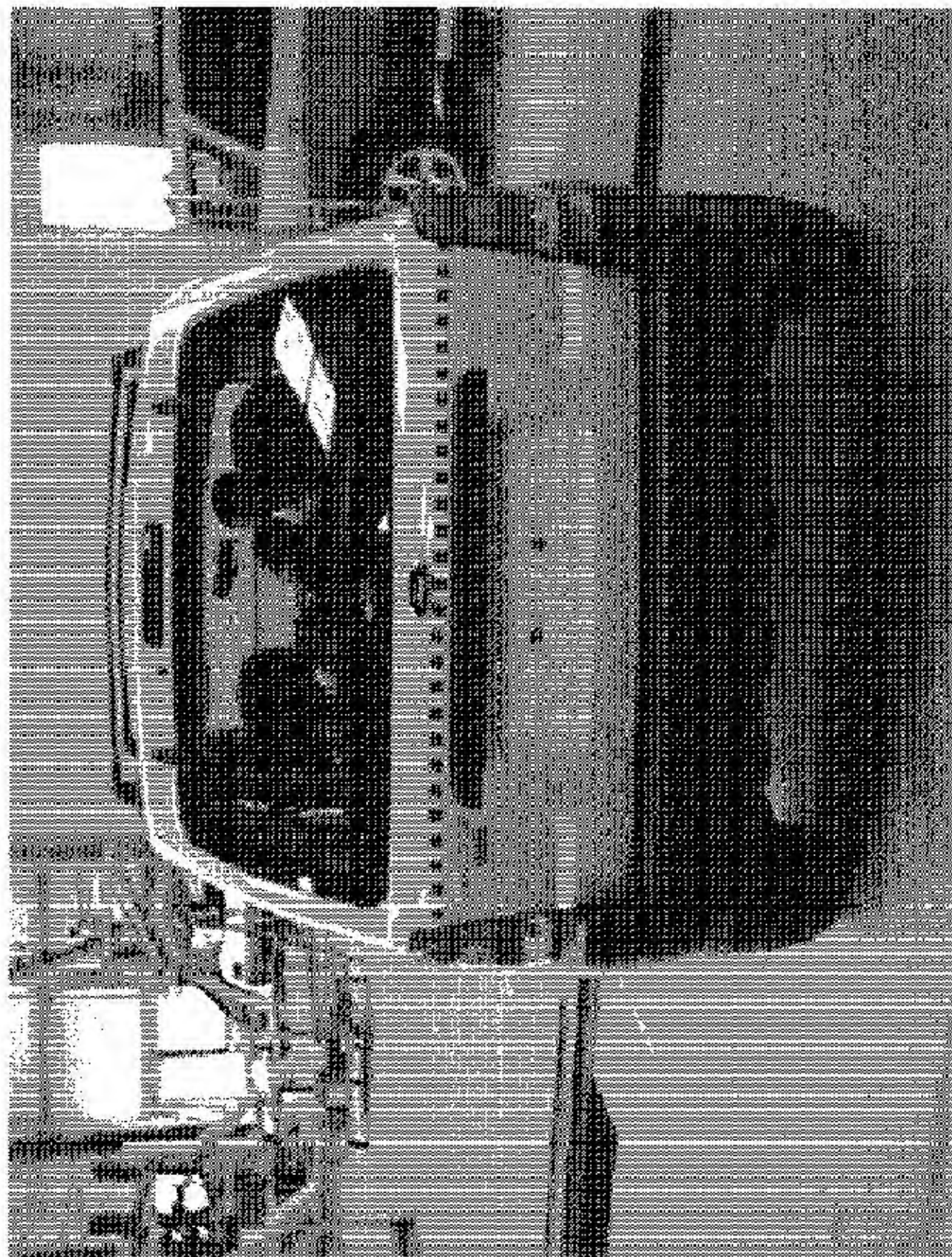
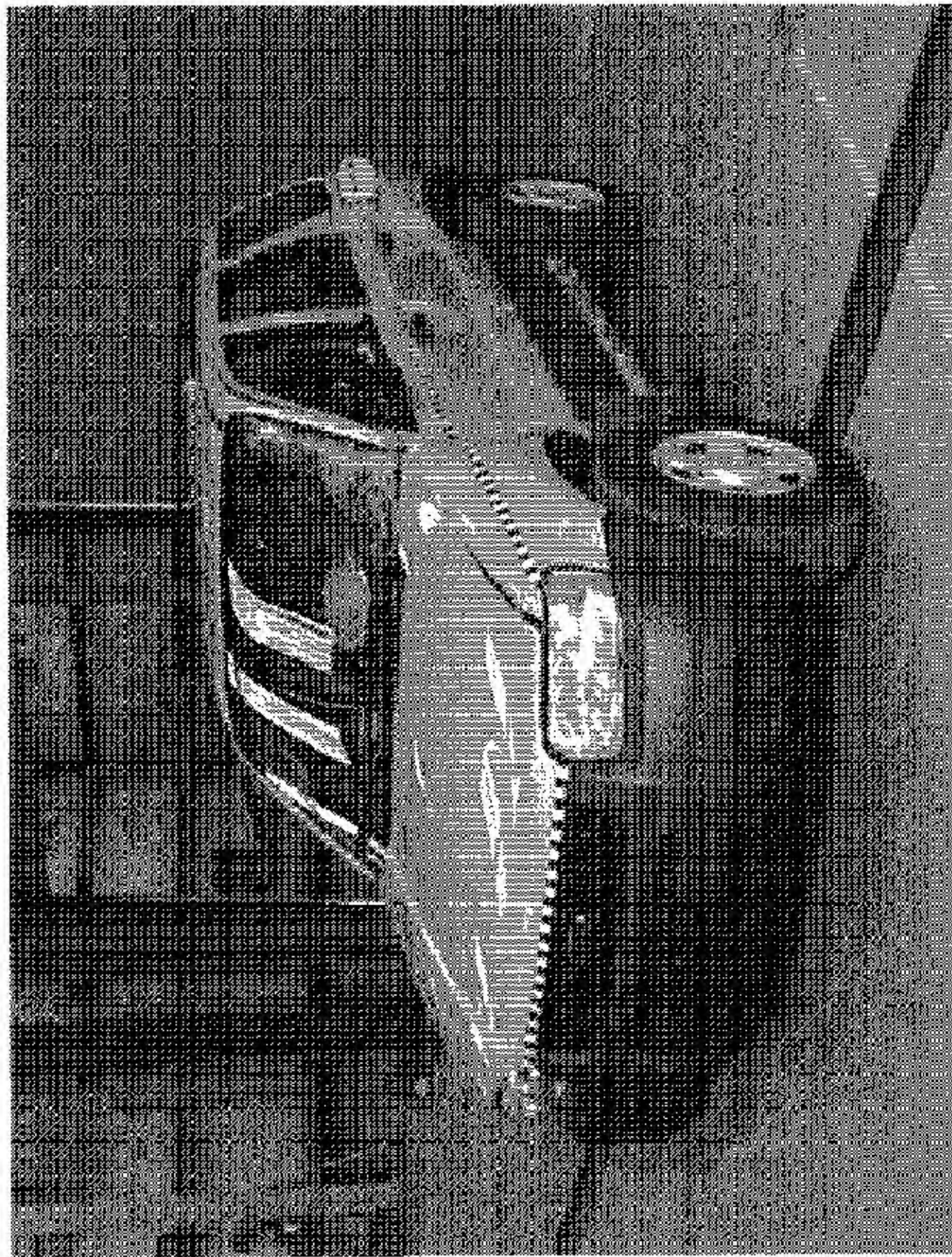


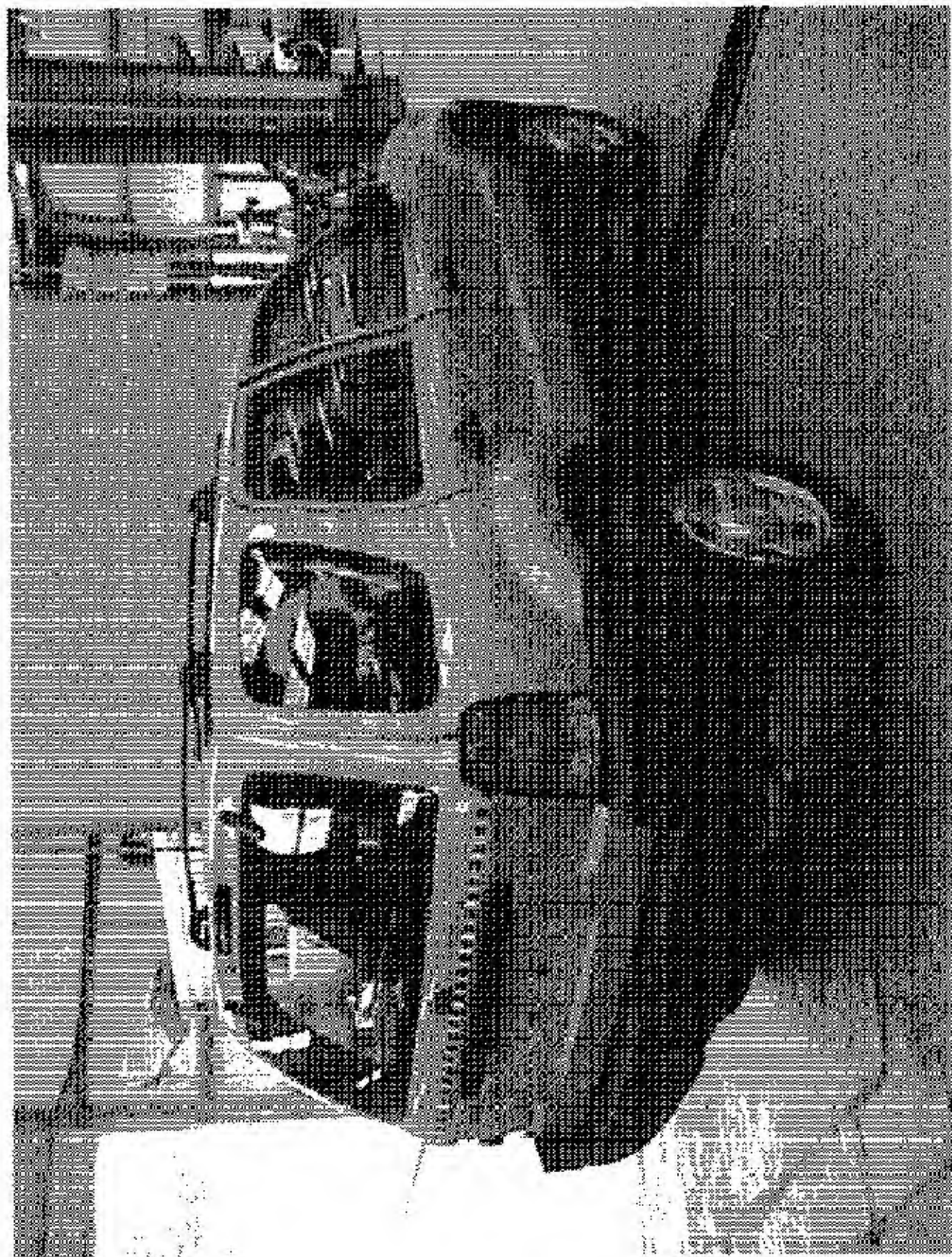
FIGURE 524
REAR VIEW OF VEHICLE POST TEST

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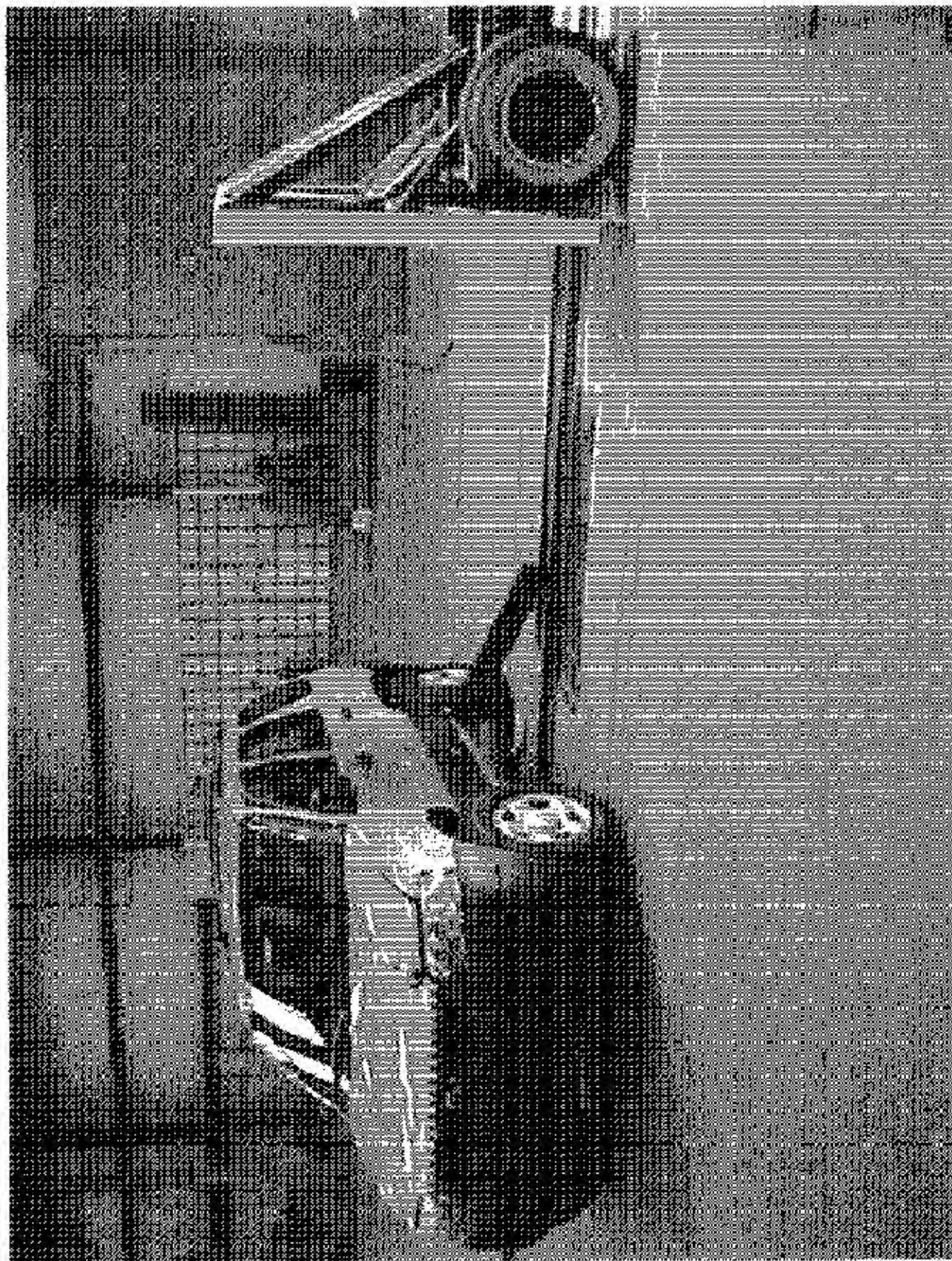
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FIGURE 5.25
3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
POST TEST



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FIGURE 5.26
¾ REAR VIEW FROM RIGHT SIDE OF VEHICLE
POST TEST



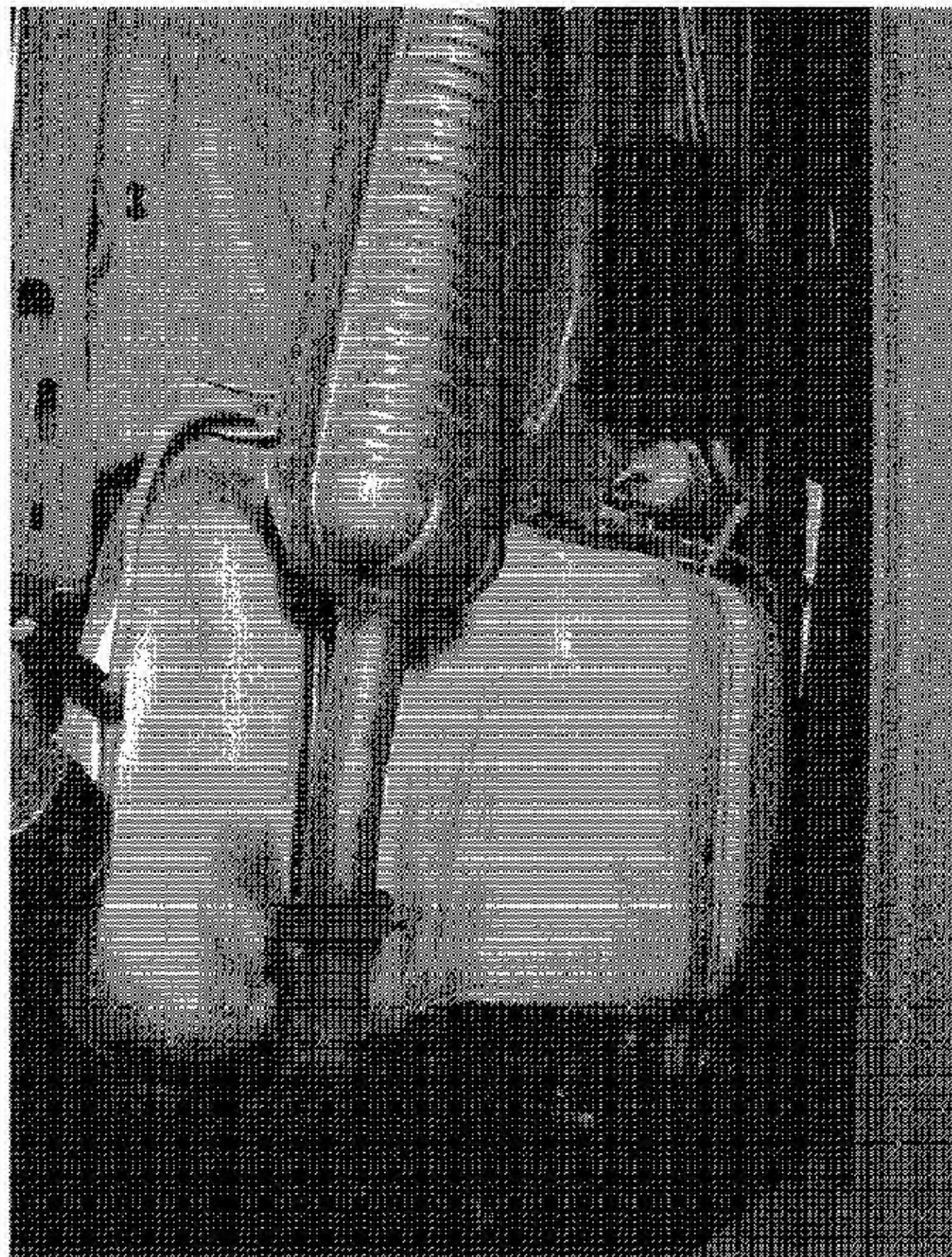
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FIGURE 5.27
LEFT VIEW OF VEHICLE/BARRIER POST TEST



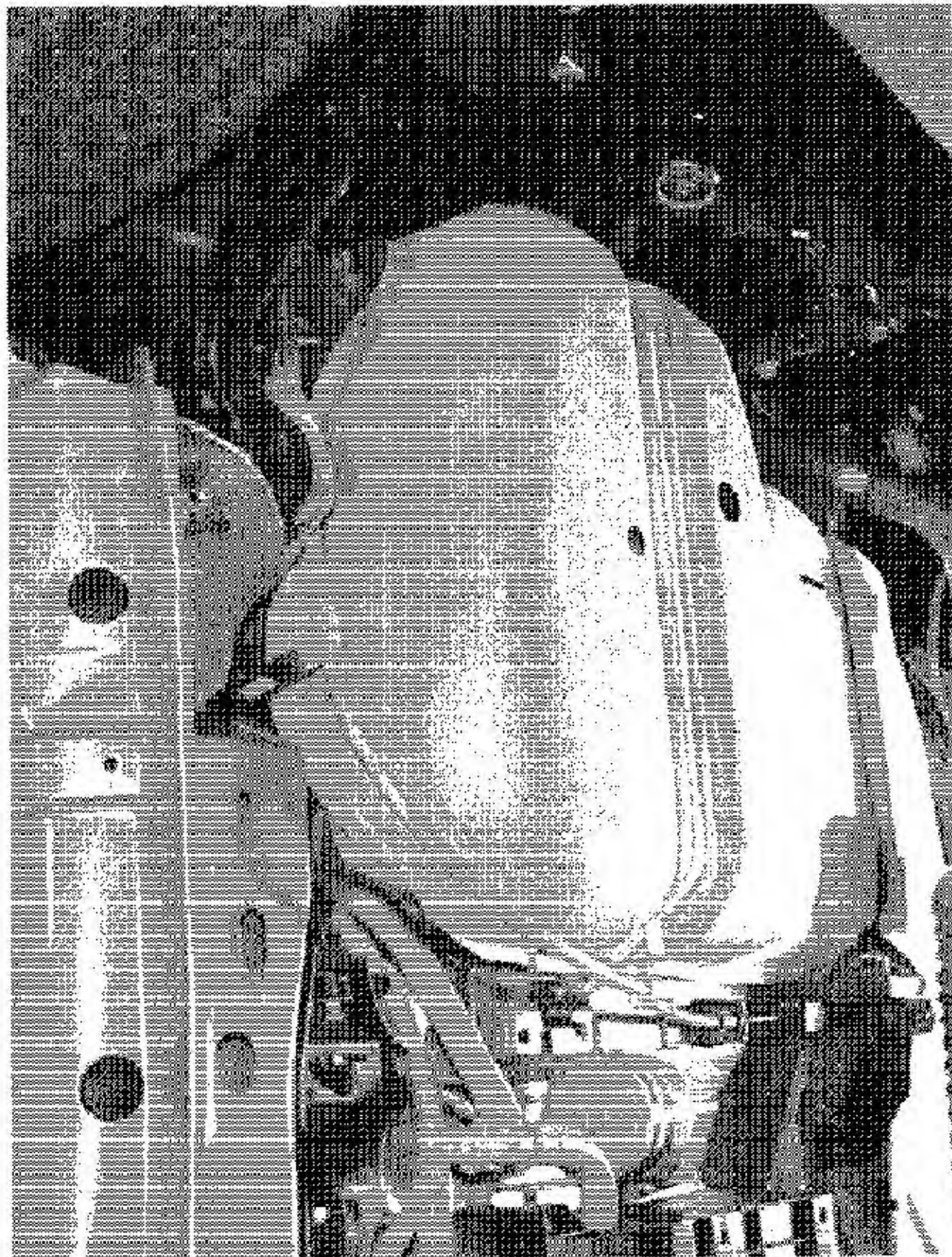
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FIGURE 5.28
RIGHT VIEW OF VEHICLE BARRIER POST TEST



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FIGURE S29
UNDERBODY VIEW OF FUEL TANK RIGHT VIEW
POST TEST



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FIGURE S.30
UNDERBODY VIEW OF FUEL TANK LEFT VIEW
POST TEST



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FIGURE 5.31
UNDERBODY VIEW OF FUEL TANK FRONT VIEW
POST TEST

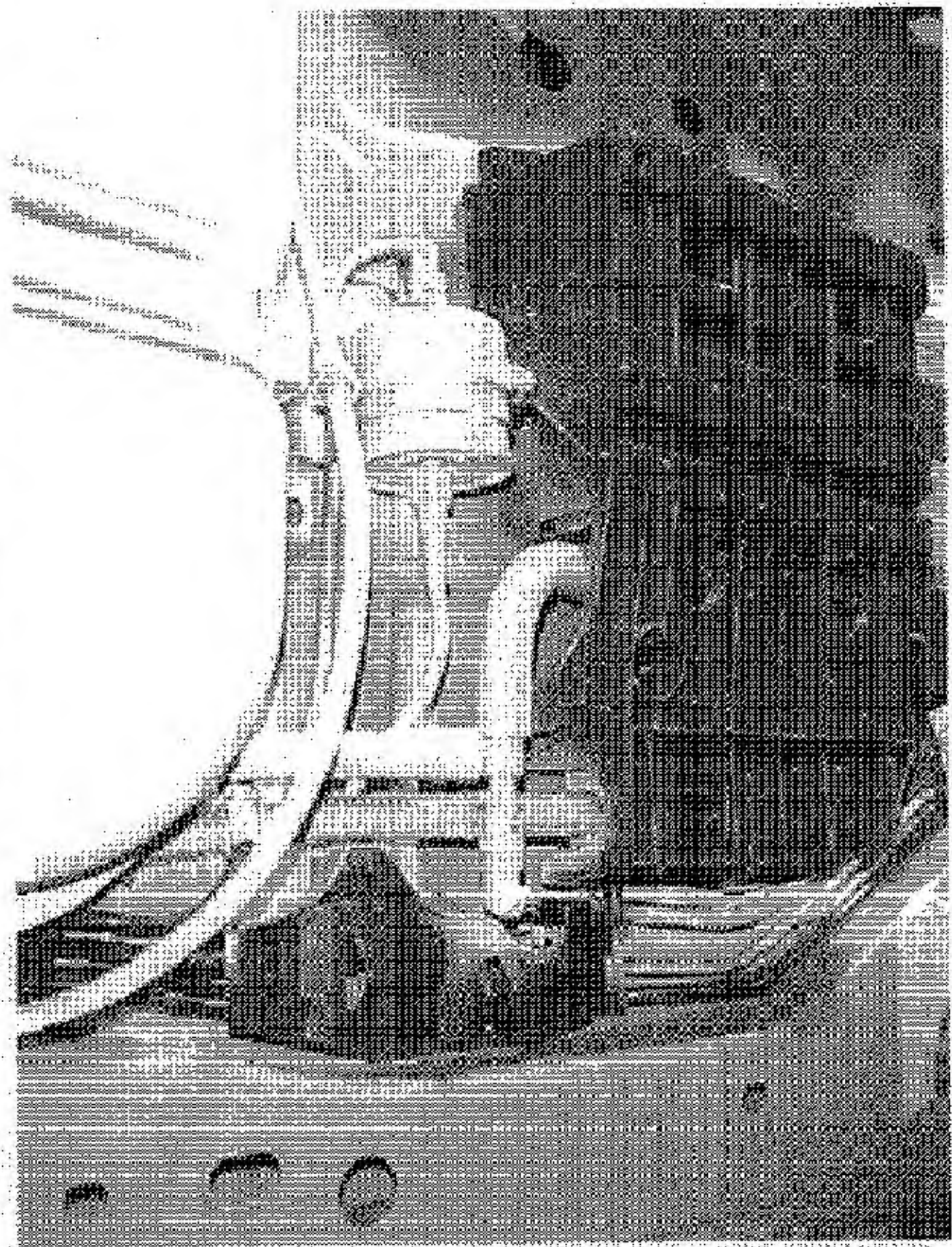


FIGURE 832
UNDERBODY VIEW OF FUEL LINES AND FUEL
FILTER POST TEST

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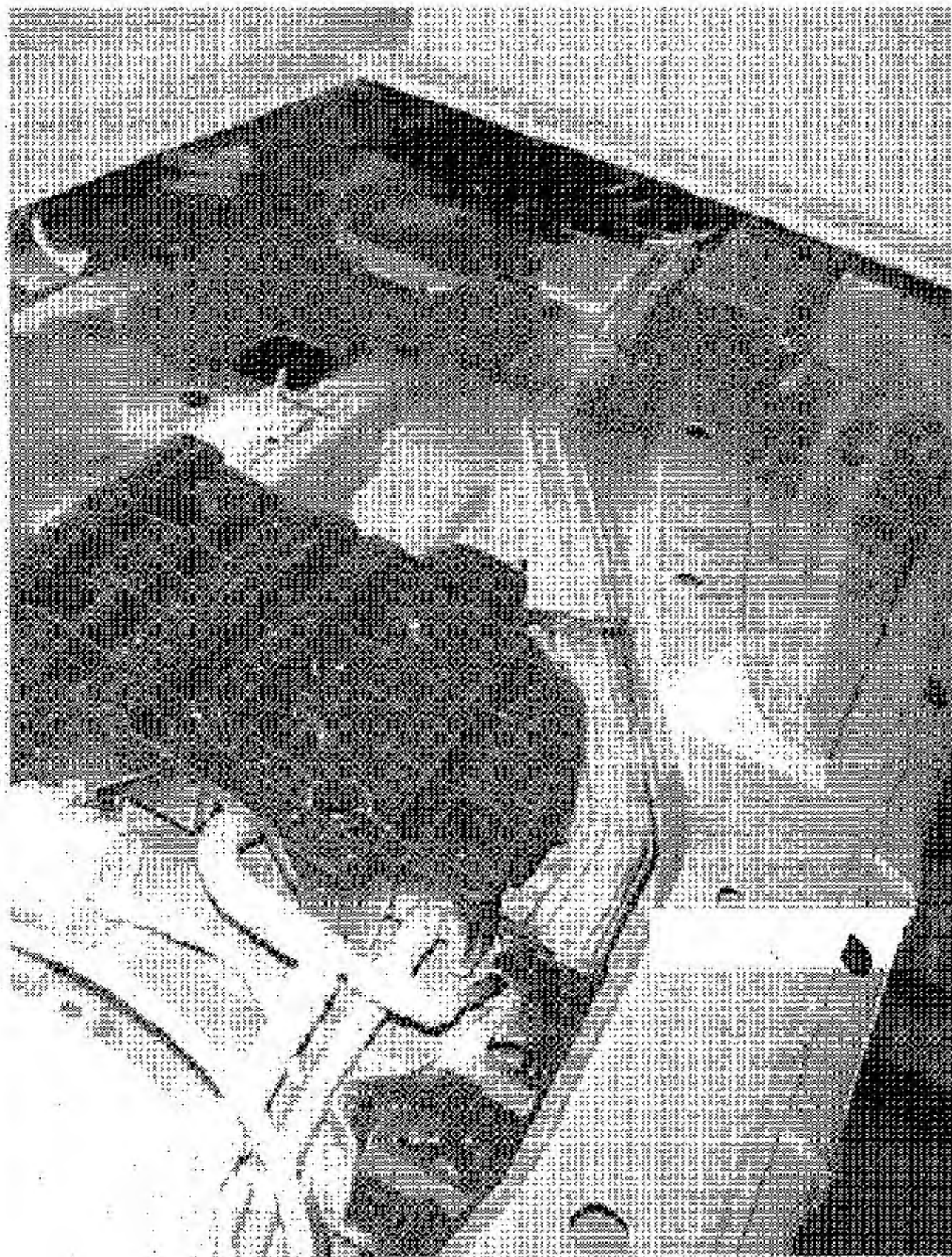


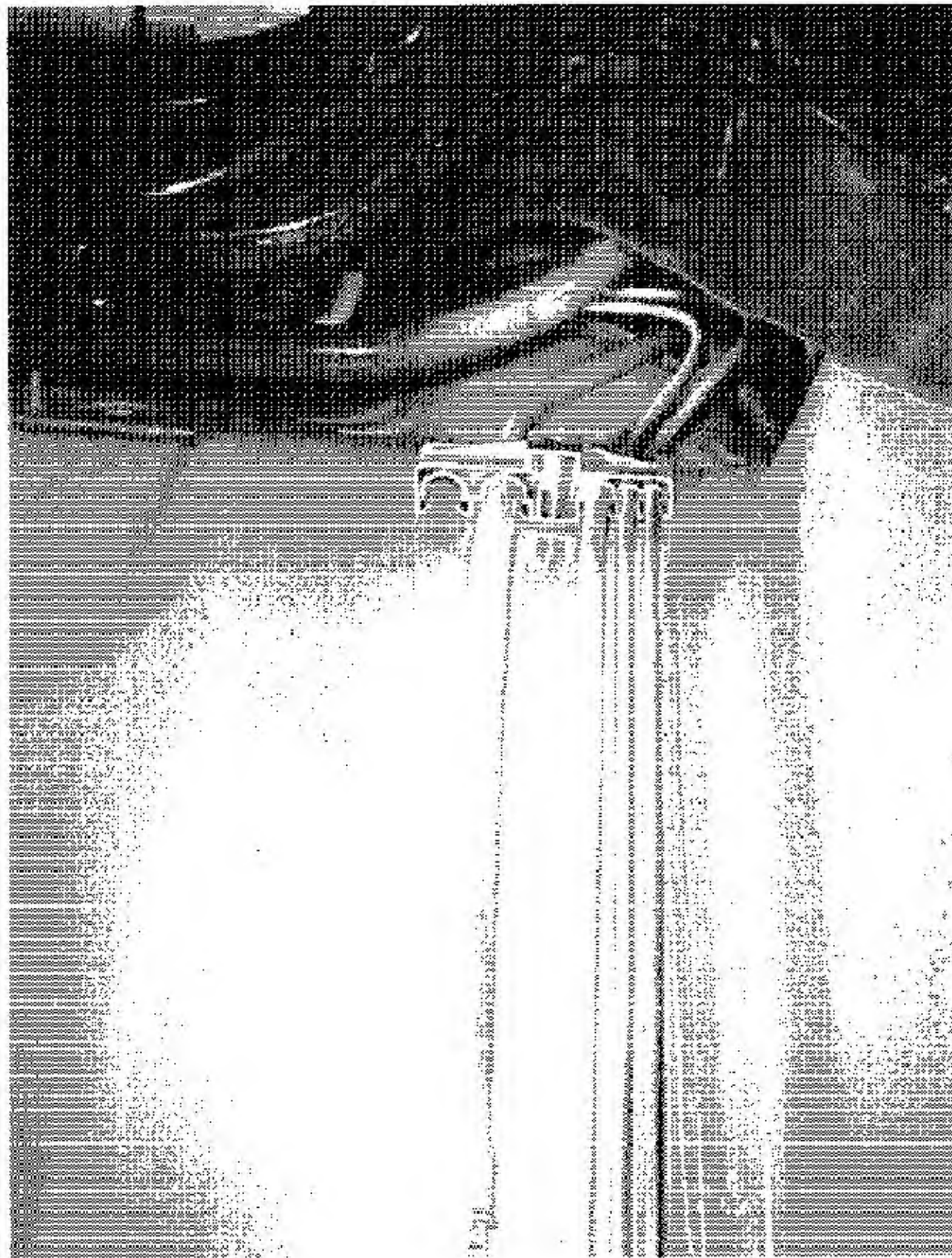
FIGURE 5.33
UNDERBODY VIEW OF FUEL LINES MID VIEW
POST TEST

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FMVSS NO. 301L



2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.34
UNDERBODY VIEW OF FUEL LINES AT TANK
POST TEST



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FIGURE S.35
VIEW OF FUEL LINES AT ENGINE POST TEST



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FIGURE 5.36
UNDERBODY VIEW OF FUEL FILL HOSE AT TANK
POST TEST

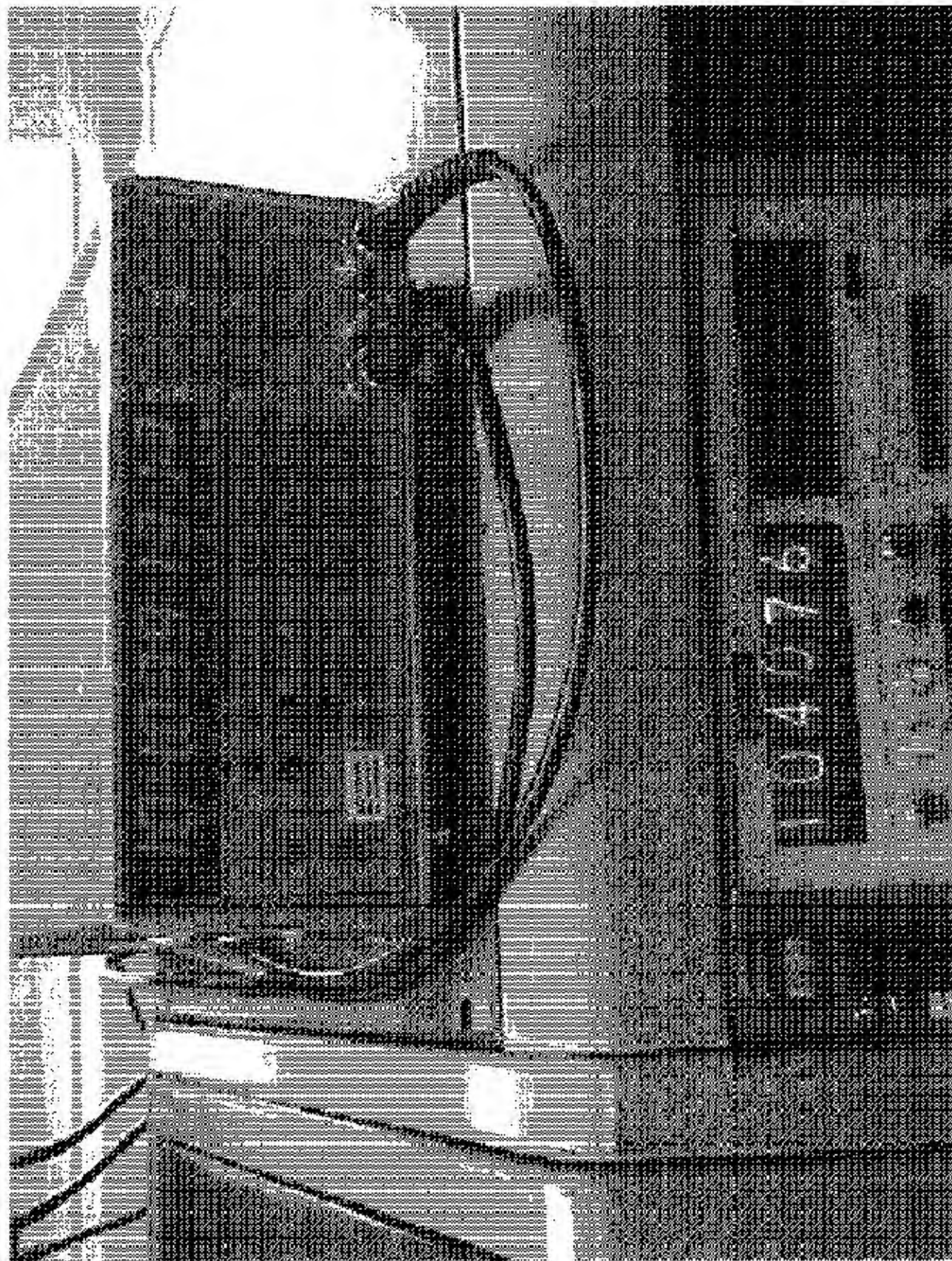
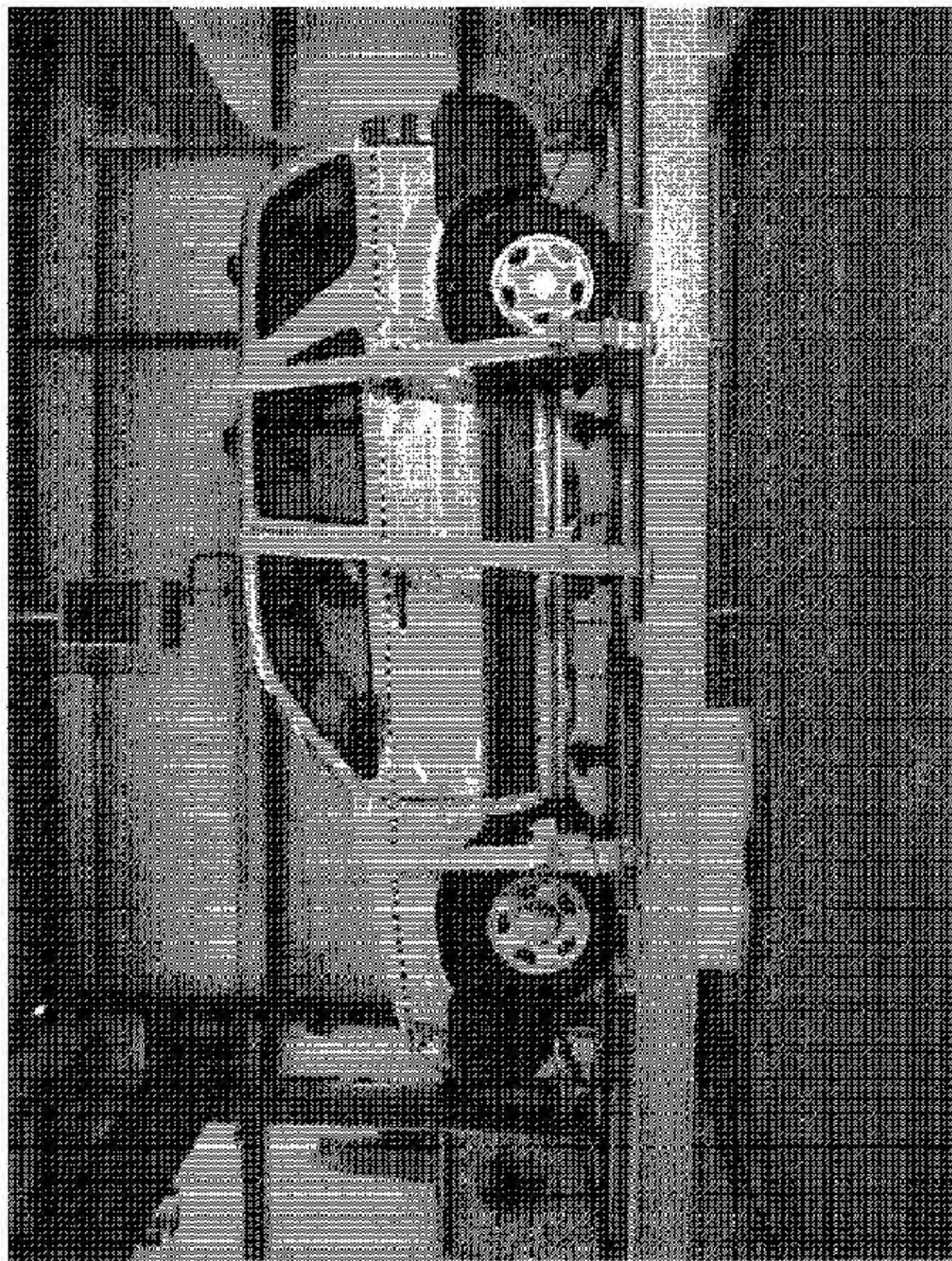


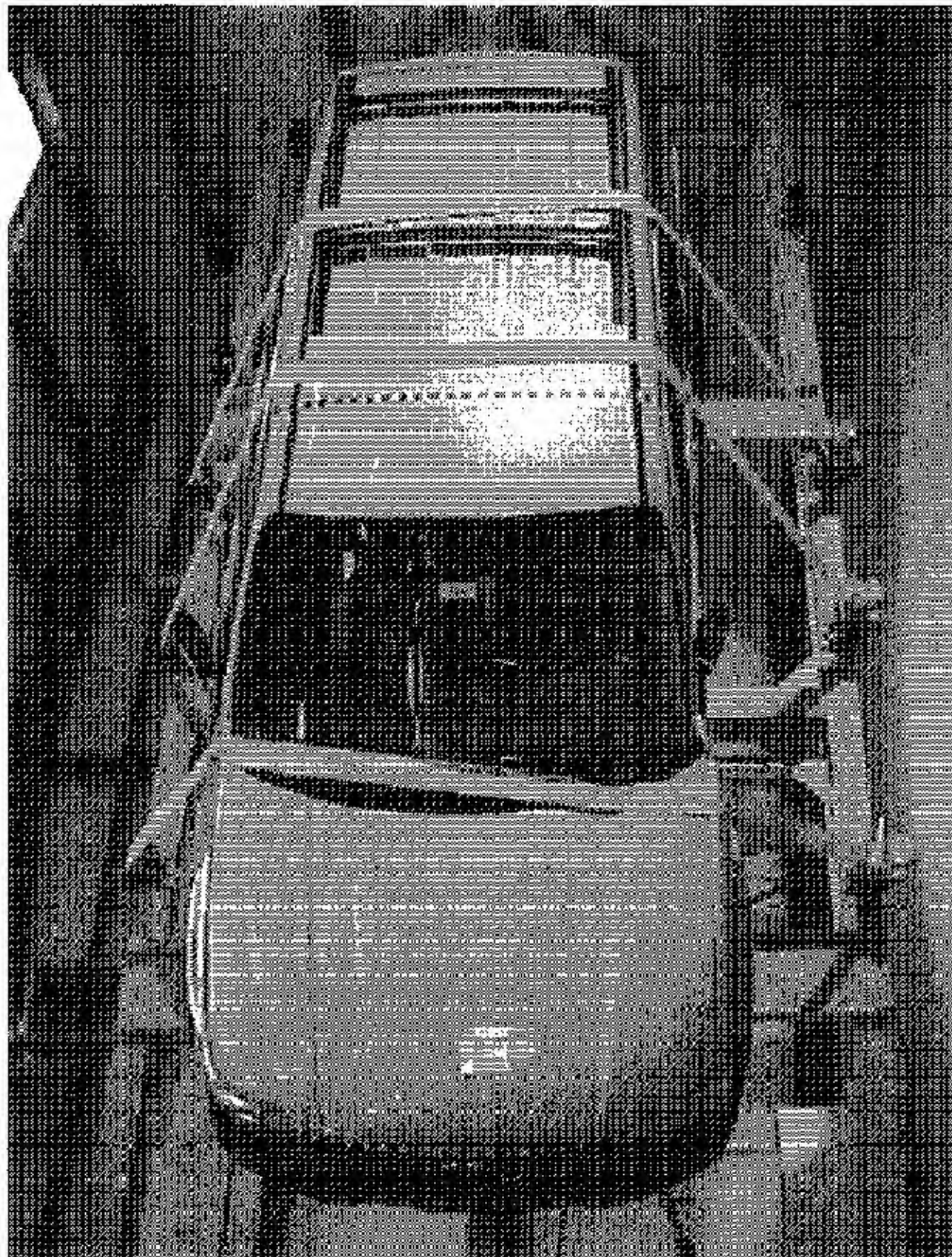
FIGURE 5.37
SPEED COUNTERS POST TEST

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2003 FORD ESCAPE
NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.38
VEHICLE IN ROLLOVER FIXTURE AT 0°



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FIGURE 5.39
VEHICLE IN ROLLOVER FIXTURE AT 90°

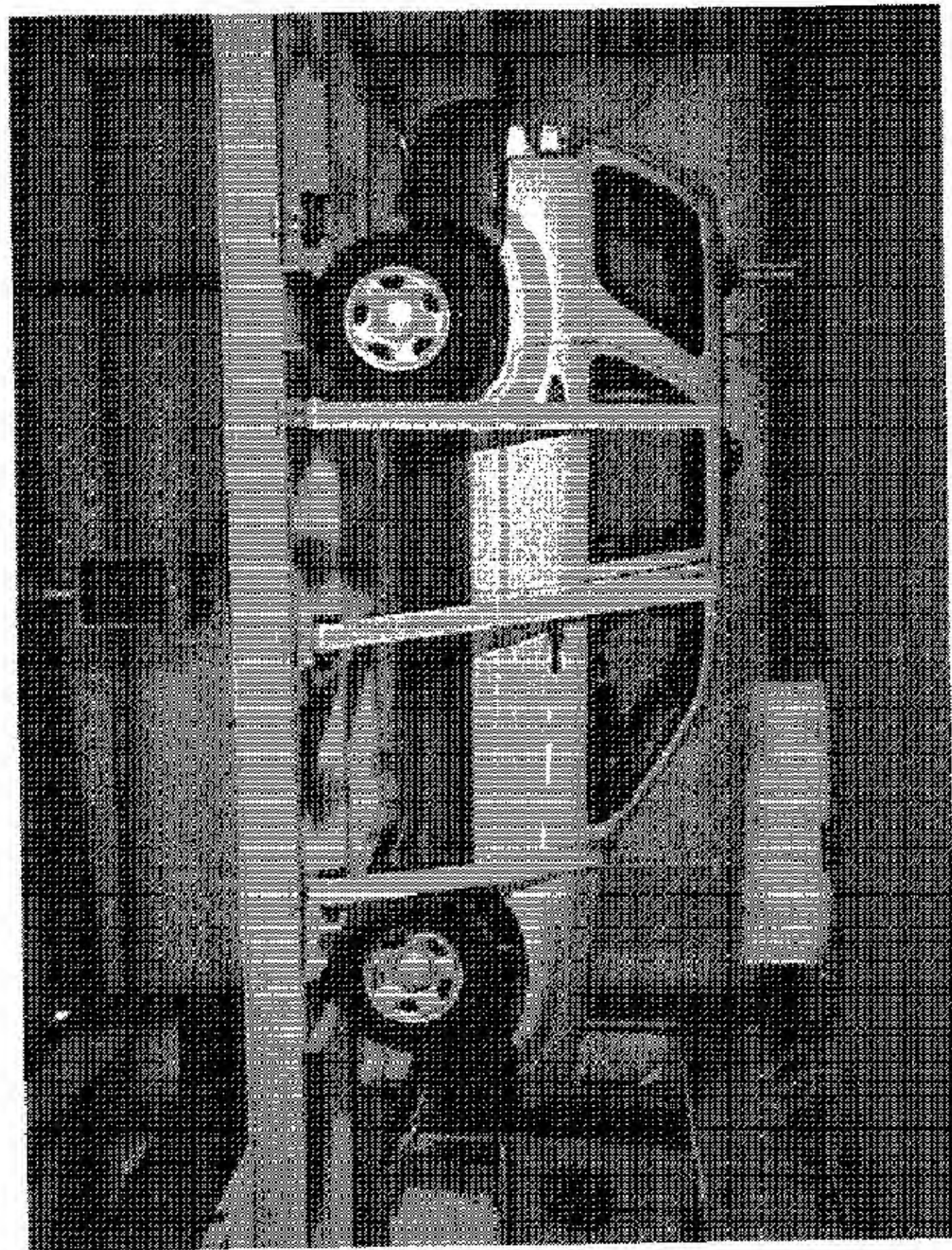
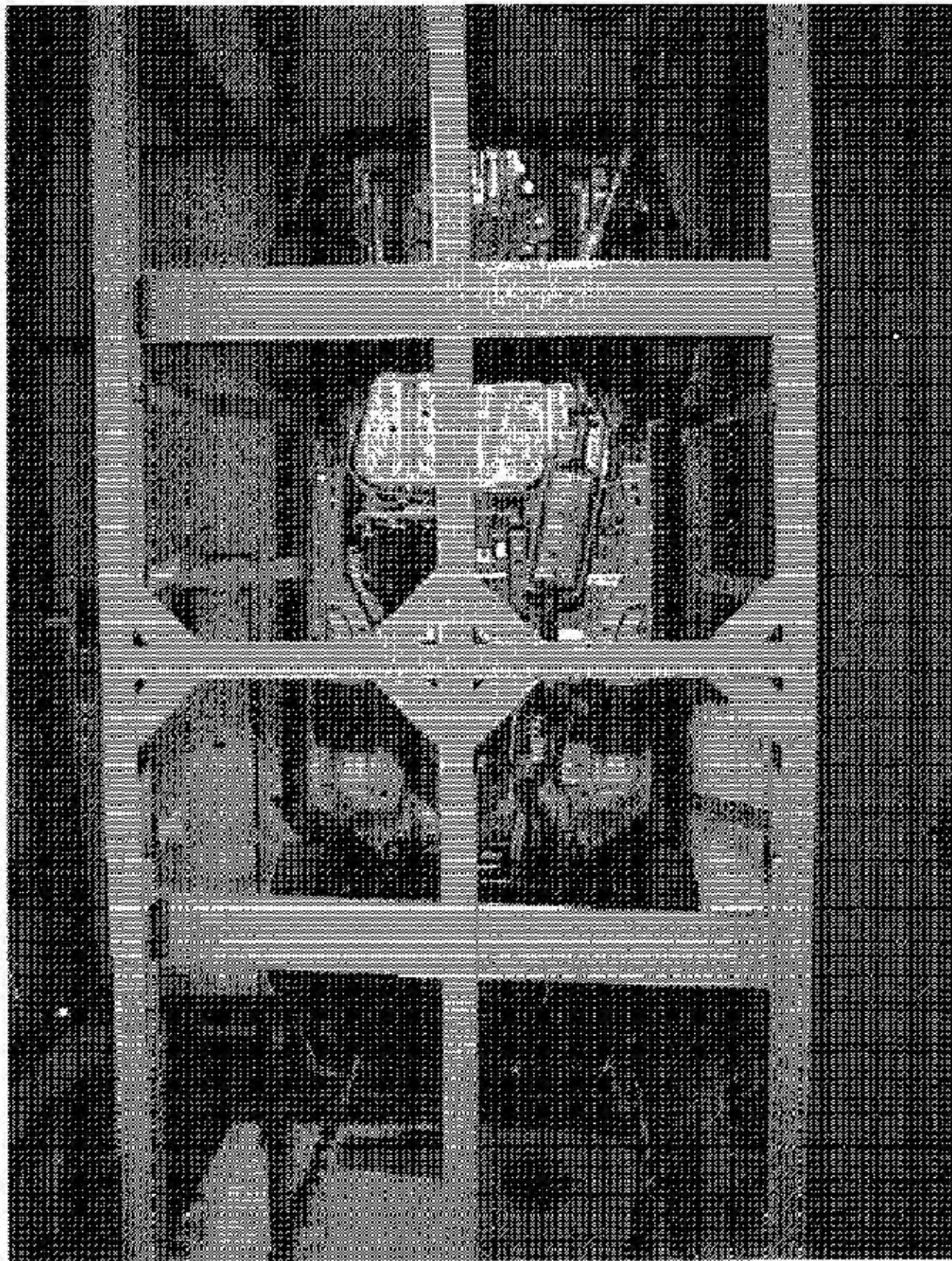


FIGURE 5.40
VEHICLE IN ROLLOVER FIXTURE AT 180°

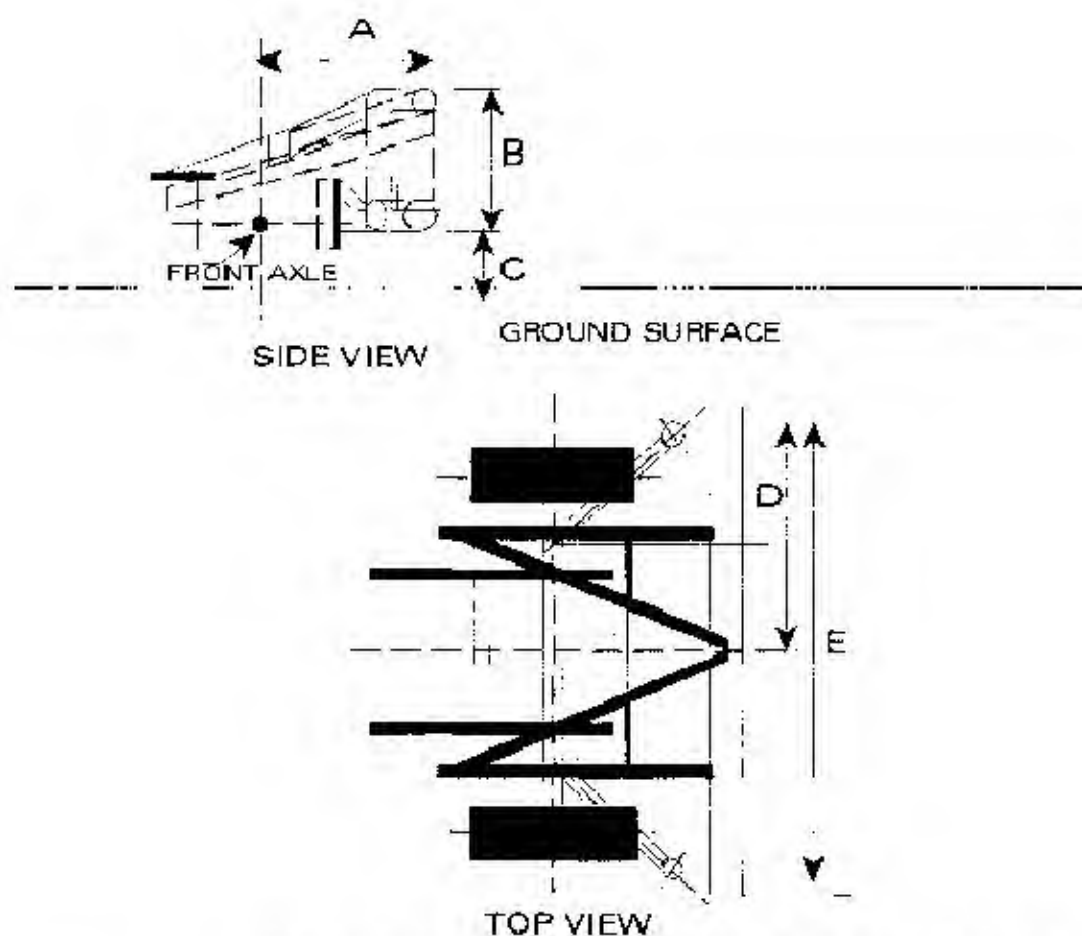
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FMVSS NO. 301L



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NHTSA NO. C30206
FMVSS NO. 301L

FIGURE 5.41
VEHICLE IN ROLLOVER FIXTURE AT 270°

SECTION 6
BARRIER INFORMATION



DIMENSIONS SHOWN IN TABLE ON NEXT PAGE

NOTES:

1. Face Plate 0.50 in. (19mm) thick cold rolled steel
2. All Inner Reinforcements 4.0 x 2.0 x 0.19 in. (102 x 51 x 5mm) Steel Tubing
3. Impact Surface above shown without .75 x 48 x 96 in. Plywood Face attached

LETTER	INCHES	MILLIMETERS
A	20.5*	521*
B	60.0	1524
C	5.0	127
D	39.0	991
E	78.0	198

TEST SET-UP OF COMMON CARRIAGE WITH 60" x 78" FLAT FACE IMPACT SURFACE INSTALLED:

LEFT FRONT WEIGHT	<u>1081</u>
RIGHT FRONT WEIGHT	<u>1079</u>
LEFT REAR WEIGHT	<u>882</u>
RIGHT REAR WEIGHT	<u>873</u>

TOTAL WEIGHT 3915

* EXCLUDING 3/4" PLYWOOD FACE

DIMENSIONS FOR GTL 60" x 78" FLAT FACE IMPACT SURFACE